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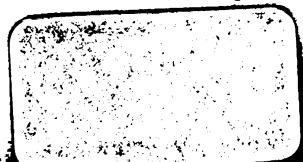
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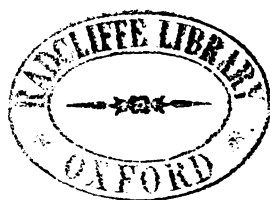
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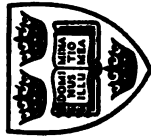
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THE
SOURCES
OF
HEALTH AND DISEASE
IN COMMUNITIES;
OR,
ELEMENTARY VIEWS
OF
"HYGIENE,"

ILLUSTRATING ITS IMPORTANCE TO LEGISLATORS,
HEADS OF FAMILIES, &C.

BY HENRY BELINAYE, ESQ.
SURGEON EXTRAORDINARY TO HER ROYAL HIGHNESS
THE DUCHESS OF KENT.

The benefits of this science are boundless;—there is no action, no movement of man, in a state of society, which has not some claim upon its use. It is of all times, and of all places—it is the first and most sacred of magistracies—having ever for its object, the happiness of mankind, and the repose and security of citizens.—*Mason.*

BOSTON:
ALLEN AND TICKNOR.

1833.



PRINTED BY C. A. GREEN.

PREFACE TO THE AMERICAN EDITION.

It is generally thought that the science taught in the following essay is rendered necessary only by a very high state of civilization, or is seldom, if ever, applicable to nations till they have reached that period of decrepitude, which constitutes their decline. But this is to entertain a very imperfect notion of the offices and advantages of Hygiène.

The youth and mid-life of nations, not less than those of individuals, need the application of salutary restraints, and many precautions.

In some respects, indeed, the early settlers of a country need the direction of the principles of this science, more than any others—the selection of healthy sites for cities, on salubrious positions and neighbourhoods for the establishment of a family, the prophylactics to the host of maladies which infect newly settled territories, and other matters like these, of great and permanent importance, can only be determined wisely, by availing of the results of investigations of the human constitution, and the laws according to which it is influenced by the various influences, celestial, aerial, and terrestrial,—with which it is in relation.

These results furnish the principles of Hygiène, and according as they are applied by individuals, or governments, constitute *private* or *public Hygiène*.

The present little volume, which has met with much favour in England, as it deserves to do everywhere, deals chiefly with the latter branch of the subject; and although in some of its views respecting the duty of rulers and the needs of the people, we cannot fully concur, we consider it, on the whole, an excellent elementary treatise.

The notice of Quarantine establishments, for example, is very imperfect and unsatisfactory. It is of great importance that rulers and people, in this country, should be well instructed on this subject at once.

The vexatious systems which exist in most other countries had their origin in popular ignorance and superstition, or in some vague apprehensions in the minds even of persons well informed on other subjects. The last named cause is liable to operate here; and unless it be removed by diffusing correct information among the people respecting the origin and propagation of epidemics, the doctrines of contagion, &c. &c., every season of panic, will impose some new and useless restraint on our commercial and personal intercommunication. In the meantime, we shall enlist an army of officials, who will constitute a corrupting item of government patronage, which will ever be employed to perpetuate the vexatious embarrassments to which we shall have so unwisely subjected ourselves and others.

Nothing is so certain to preserve us from such a state of things, in this country, as popular treatises, which shall teach, by promulgating rational principles, the kind and degree of interference which government ought to exercise for the benefit of the public health.

Another particular which ought to command the attention of an intelligent health police, and which is not distinctly noticed in the following pages, is the adulteration of articles of food and drink, and the introduction of deleterious substances into confectionary,—the general principles, however, and be used in the judicious regulation of all such matters may be found, compendiously stated here.

The publishers hope that this first elementary book on the subject of Hygiène, which the American press has offered, will have the effect at least, to draw the attention of their countrymen to a matter which is every day assuming stronger claims on their notice, and that the deficiencies of this small volume will soon be made up, and the sound doctrines it contains more fully illustrated, and rendered more applicable to our own state of society, by the labours of American authors.

Boston, May 7, 1833.

P R E F A C E .

THE object of this little volume is to direct public attention to an interesting branch of knowledge, which, hitherto, has not met in this country with the consideration it deserves. It is a subject, to which, when once the attention of all educated persons is sufficiently aroused, their own unaided sense and experience will bring continual accession;—a result the more desirable, as it rarely occurs, that persons who have made the science of Medicine their immediate study, are called to the performance of those duties which have the most direct influence on the physical improvement of communities; and with a due discharge of which, a knowledge of the subject in hand, is inseparably connected.

The author must observe, that, as practical knowledge is only derived from a concurrence of opinions, joined to the experience of ages, his work must contain much borrowed light; he cannot, however, refer each separate opinion to its originator, nor can he answer for more than the general accuracy of the facts. To condense so large a mass of knowledge into so small a space, and to refer to each source whence an often-treacherous memory has

borrowed, would be a task more difficult and laborious than the writing of many volumes. Fodéré wrote eight volumes on this subject without exhausting it; and since the publication of his work, we have been proportionately enriched from the increased resources of civilization.

Our principal object, then, is, to recommend to more general attention, a particular study, which includes in an extended view, the springs of Health, and the sources of Disease, in communities; and whose utility, when once understood, will be its best eulogy. We shall attempt to prove that utility, by grouping under its several heads, facts which are both interesting and immediately available. But, we must observe, that neither by this short treatise, nor by a second, which we propose to publish, should leisure and encouragement second our intention, can full justice be done to so vast a survey.*

* The English authors from whom we have borrowed facts and opinions, will be readily recognized, where we may have omitted their names. The principal foreign sources to which we are indebted, are the works of Parent du Chatelet, Villermé, Benoiston de Chateauneuf, Berard, Virey, Cabanis, Lachaise, Deslandes (whose excellent little Manual has been of great service), Londe, Fodéré, Hufeland, Frank, Ulloa, Ramazzini, &c. &c.; and from the several other authors who have written on Hygiène, in the *Annales de l'Hygiène*, and in the Grand "Dictionnaire de Médecine," in sixty volumes—one of the noblest achievements of our age, as regards medical literature.

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INTRODUCTION.

It is the purpose of the following essay to investigate the influence of laws, institutions, habits, climate, &c. on the vigour and health of man; and, with a view to practical utility, to apply the results of these inquiries more particularly, though not exclusively, to this country.

Under the name of "Public Hygiène," this study has obtained high celebrity on the Continent; but private Hygiène, or a study of the sources of individual health, connects itself naturally, and, indeed, inseparably, with the former, at every step. Some branches of the subject—as medical statistics, legal medicine, &c.—are shoots of the present science only lately sprung forth in full vigour in this country, but they must now remain inseparably engrafted on the tree of general knowledge.

In proportion as this study is known, will its value be felt and acknowledged. If lights and advantages, of which we have recently been put in possession, are now deemed indispensable, it is because civilization converts refinements and improvements into necessities. Thus, in a state of nature, to the wild Indian

is the physician unknown, and his help-mate brings forth without that assistance of obstetric science, the absence of which, in the hour of need, in civilized life, would strike fatal terror into a woman's heart.

One of the chief sources of the wealth and power of states, is the number of their well-governed and well-conditioned inhabitants. Hence, it should be the object of statesmen to improve that moral and physical condition which is favourable to the regular, but not unnatural increase of a sound population ; and facts, derived from the medical statistics of different countries, eminently contribute to the elucidation of this subject.

A knowledge of Hygiène is of high importance to political economy ; a knowledge not ministering to mere theory—to day-dreams of inexperienced legislators ; but to that cautious policy that seeks no footing where there are no facts. Hence have the Medical Statistics of Dr. Hawkins, and the more recent Tables of Mortality of Mr. Marshall and others, become objects of legislative attention. Hygiène, too, sees, in a new code of political economy, its most efficient ally ; provided always, it be so managed, as not to depress too suddenly old branches of commerce, that have risen under the sanction of peculiar laws. But forbearance towards abuses, wherein a state's safety may have become vitally involved, will not be inconsistent with a careful avoidance of similar mistakes in future :—Forcing no manufacture, keeping up no branch of industry by high protecting duties, allowing

a free intercommunication of commerce, are precautions which obviate those fluctuations of trade, &c. which are eventually productive, not only of misery, but of disease and mortality.

On perusing the facts interspersed throughout the following chapters, connected with health and longevity, the balance will appear greatly in favour of England. To reconcile this with the neglect hitherto manifested with respect to our subject, we must observe, that England, indebted to her commanding insular position, for a long course of internal peace, and a monopoly of commerce, has experienced a prodigious increase in her population. The wealth of her merchants has eclipsed that of the Florentine or Venetian Princes of old. Hundreds of millions, borrowed by Government, afforded, for a time, an exorbitant interest to the monied portion of the community; and restrictive laws made the agriculturist a welcome sharer in its prosperity. Such were the sources of health and longevity—such was the powerful substitute for that Hygiène, which, hitherto neglected, must now, in the decline of that prosperity—in the pressure and collision of sinking interests—in the rainy day of hard labour and light earnings—of insufficient food, raiment, and lodging—and of a whole train of moral, superinduced by these physical, evils—be speedily and strenuously invoked.*

* The daily reports of Cholera now arriving from Paris, would tend to diminish the good opinion of Hygiène there sedulously

The reports of longevity are, of course, given on the average; but, on a closer view, we find a frightful disparity between the span of life allotted to the rich and the poor. It has long been known, that a hard-working agriculturist, with his ruddy health and strength of limb, does not live so long as the delicate and intellectual patrician, who envies his apparent advantages—that mechanics are commonly worn to death, in a few years, in the manufacturing of luxuries—whilst a trembling sensualist, who has lost all useful energy of mind and body, if he be rich enough to command all the resources of our civilization, will spin out his automatic existence to an advanced age.

No person can fail to wish this disparity reduced. It were superfluous to describe as a blessing, that which must of necessity comprehend every other blessing—*Life*. It is the hold, and the share, which each man possesses on the moral and material world around him—the ground-work of all his hopes—which, even

followed. The fact is, that as this salutary zeal is only of a few years' standing, it has been impossible to excavate and re-construct so much in the whole of the ancient town of Paris, as would be necessary for the establishment of common and private sewers, &c. The Cholera is besides attacking a nation agitated by forty years of wars and revolutions, and one but just awakened from all the misery of the violent commotion which has lately occurred. Men of science have to contend with popular prejudices, and with the rights of chiffoniers, &c. The least innovation leads to a tumult; but let any person of judgment peruse the "*Annales de l'Hygiène*," and he will there see fruits and discoveries of the most important character, and of enduring value.

when divested of every charm, is clung to, as the boon, which having been assigned him by his Maker for a certain term, it is the most heinous of crimes to take away; and, on the same principle, a grievous cruelty to tamper with, or shorten. To enhance the value of Hygiène, (which so much contributes to it,) we must consider longevity, with relation to the prosperity of nations.

Since it is certain, that every stage of human existence has a peculiar office assigned to it, as well as every instant a duty, it is highly important that man should attain a certain degree of senility. Should the human being die in infancy or childhood, the loss to the state would not be great; but later, it is far otherwise. The business of adolescence is to acquire knowledge by example, and by memory; of the adult to apply this information; and later, to invent. At fifty, men begin to perfect and classify knowledge; to instruct and guide their fellow-creatures. Now, it is clear, that a state cannot advance so rapidly in civilization, where the average duration of life is short; and will be great in proportion to the approach of the majority of its subjects to sixty-five—an age that allows of acquisition, application, invention, and arrangement of the stores of knowledge. We must venture to repeat, that a man dying at eighteen or twenty, has only lived to *consume* the resources of society, and can leave nothing behind him, but a legacy of poignant regret. If he live till he has applied and invented, it is of the highest importance he should be allowed time

to mature and consolidate what, as his own acquisition, he best understands. One able man may, perhaps, do more from the age of thirty-five to sixty-five, than twenty more coming after him, and dying successively at thirty-five, thirty-six, and thirty-seven, and so on to sixty-five. We must not forget, likewise, that there is a period anterior to death, which is incapable of useful effort of mind and body; and (however short the rate of existence in any nation) some years of useless dotage will generally precede death.

We must set a still greater value upon longevity, if we add to what has been stated, the sagacious remark of an eminent writer—that the greater mortality in southern climates before the age of thirty, is the reason that northern nations have invariably conquered those of the south.

Enough, we think, has been said to excite an inquiry, whether the present is not a study obligatory on those upon whom devolves the duty of directing the affairs of men—from the prime minister, through every gradation of office, down to the overseer. It no less imports to clergymen, heads of families, and all those who, by affluence, or other circumstances, possess an influence over those amongst their fellow-creatures, less gifted by fortune and education; and, as we proceed, we shall make it a special object to point out occasionally to each class of these influential persons, how their moral responsibility is concerned in each particular topic.

In our Second Part, when we come to that branch

of Hygiène which treats of climate, we shall remind statesmen, how cities have been built on localities destructive to life; and how colonists have been consigned to inhospitable shores, where latent, but inevitable, death awaited them. We shall note, for the benefit of future military commanders, how the bravest armies have perished, inglorious victims to the grossest ignorance of the deadly character of some site in the country they were led to invade. Nor shall the traveller escape a salutary lesson, on the fatal consequences of a neglect of this study.

The host of curious facts which the reader is about to encounter, are not classed according to a rigid system—but it may be advantageous to study them as they are placed.

We shall direct his attention,

First,—To remote physical influences—those of the heavenly bodies, for example, &c.; showing even their active and continued operation on human existence.

Secondly,—The singular laws that influence propagation—showing amidst some still hypothetical views, how much of positive and available knowledge we have attained.

Thirdly,—Emanations—both those that arise naturally from the earth and its productions, and some of those that are elicited artificially.*

* We have in this Chapter reserved the Emanations from Marshes, for a more convenient and extended disquisition.

Fourthly,—We shall consider the subject of Effluvia—under which head we propose to glance at the police of health, and at a great number of sources of disease, several of which are absorbing topics of disquisition at the present time.

Fifthly,—We shall take a rapid survey of the bearings of civilization on human life—which will enable us to advert to the characteristics of political medicine, and complete the outline of this our First Part of Hygiène, which constitutes in itself a separate treatise upon the subjects which it embraces, although more ample illustrations and elucidations may be offered hereafter in a Second Volume.

These points of discussion will suffice not only to interest and amuse, but to prove, that the subject is fraught with important practical results, and that “there is no act nor movement in man, in which it may not be concerned.”

To its two aspects—the public and the private—our limited space does not allow us to do ample justice;—still we hope to indicate legislative measures, and general habits, by which health may be beneficially controlled.

From the earliest moment of existence, to the last stage of human decrepitude, an influence of the most decided kind may be exerted over mankind; nay, not only from the very threshold of life; even the form and qualities of the future being may be modified by attention to the rules of Hygiène. Persons, the least conversant with the subject, may

easily understand at least the probability of this assertion, if they do but possess a general idea of the construction of the human frame. Within us are vascular systems, whose minute ramifications baffle our powers of computation and description. The offices of these sets of vessels are to secrete or deposit new molecules or atoms, derived from the materials of our sustenance—to absorb superfluities of the nutrition thus effected—and, lastly, to furnish to the wear and tear produced by the exertions and trials of life. Here then is a constant absorption of old materials, and deposit of new, taking place. Thus, in a certain space of time, the frame is no longer constituted of the same materials, although the character of the natural laws presiding over this mutation, is constantly to preserve outward identity. Since, therefore, such changes are unceasingly going on, even in the hardest constituents of the frame, the constitution of the individual must depend on the media (atmosphere, &c.) in which he is placed—the food from which he is elaborated—the exercise and use made of the nervous energy by the brain, in obedience to the passions of the mind; the health of man consequently depending as much on the circumstances acting upon his body and mind, as that of the shrub does upon the sun which vivifies it, and the soil in which it is planted.

If we compare the legislation of our times and country with the laws of nations now extinct, or in decay—as those of Rome and Greece—or of Eastern

nations—nothing is more striking than the diminished vigilance it exercises over public and private health. This may be in a great measure explained, although not so as to remove all blame; however, the more difficult it may be for governments to interfere on this subject, the more imperative is it on individuals to become so far conversant with the effects of physical laws, that their habits may supply the deficiency. Formerly, the enlightened wisdom of a very few watched over the gross ignorance of the many; at the present day, the avenues to general knowledge being open, every educated individual should not only acquire sufficient for self-protection, but be able to contribute some share towards the welfare of the community at large.

CHAPTER I.

SUBSERVIENCY OF MAN TO PHYSICAL INFLUENCES.

PREVIOUS to the consideration of those branches of our subject which possess a greater number of results immediately applicable, we must prepare for the study, by a contemplation of some more general influences. We begin by the first that naturally presents itself—a subject, however, by no means destitute of interest, or of facts capable of useful application.

In order to feel in its full force the absolute dependency of man on the surrounding elements, we must begin by stripping him of the accessories of his artificial state—of the confidence he derives from his social and collective position—of the glare cast around him by his passions and imagination—and of all the adventitious circumstances by which he is dazzled and misled. We must view him in his naked and comparative insignificance on the surface of the great globe he inhabits—in his mortal frame, no more than a minute and momentary combination of its elements—beautiful, indeed, but quickly resolving itself again into them, in obedience to the common laws that pervade it. As a constituent portion, therefore, of

his terrestrial abode, he is not only concerned in its immediate economy—in its productions, of whatever reign, and whether hostile or friendly to his nature—in its forty miles of circumambient atmosphere—in heat, cold, and light, whatever their sources—in the electricity lurking in the clouds above—and in the operations of the internal world beneath him; but he is also a partaker in the mighty and remote influences which govern his planet, and bid it revolve in the fields of space.

Men have long since agreed to reject the exaggerated opinions entertained by their forefathers, as to the great influence of the heavenly bodies. But as popular opinions can only proceed from, at least supposed, experience, so they are generally found to be grounded on truth, and of practical utility. On the subject of planetary influence, one of the greatest mathematicians of the age has observed, that it would be unphilosophical to doubt the existence of influences, because we cannot explain or test them by any means we at present possess; that we must have recourse to a calculation of probabilities; and that all we have to determine is, how many coincidences of supposed causes with positive effects, are requisite to establish our belief.

Whilst we know that the diurnal changes, the tides, the tropical winds, are affected by sol-lunar influence, the actions of the human body, particularly when diseased, appear likewise to acknowledge, directly or indirectly, allegiance to the same power. We may

smile at the blind credulity, which induced Tiberius and Varro to submit to the operations of the tonsor only at certain phases of the moon; we may receive with suspicion those observations, which would claim force from analogy, proving the increase and decrease of the size of some animals, the agitation of others, &c. at the time of the full moon;—observations supposed to have originated the old custom of shearing sheep, castrating domestic animals, &c. only at certain of her phases. Even though we may consider with some distrust, the power of lunar influence asserted by some, on the duration of gestation and incubation, and on the recurrence of the peculiar function of women; still we have a multitude of facts, that induce us to believe in that power, either alone, or in combination with the sun, on human life. Chancellor Bacon was subject to syncope during eclipses of the moon; Matthew Faber speaks of a gentleman who always spent the days preceding an eclipse, buried in thought, and melancholy, and who, when it took place, rushed headlong into the streets, striking with his sword every thing he met. A young girl is reported by Hoffman, as labouring under an extraordinary painful swelling, beginning and finishing with the increase and decrease of the moon, &c. &c. &c.

In all parts of the globe, men have thought they recognised lunar influences on the crises and exacerbations of disease. The phenomena of the invasion and duration of fevers, appears to be controlled by that influence. This is seen more distinctly as we

approach tropical climates, where generally the operations of nature partake of a development very favourable to scientific investigation. Dr. Jackson states that in Jamaica, the febrile intermittent and lunar periods correspond. Dr. Lind observed the same phenomenon, and adds, that deaths occur mostly during the ebb of the tide; and that eclipses produce dangerous relapses in those ill of fever. Dr. Balfour, in the Asiatic Researches, says, that when the sun, during the equinoxes, by approaching the equator, increases, by his power, the attraction of the moon, with the increase of the tides occur also the increase of violent fevers, and mortality.

The sun, being the centre of our planetary system, has also independent and more extensive influences. Without recurring to the more minute or apocryphal, we will advert at once to those exerting powerful effects on the human frame; although the reader curious in such matters, may find in scientific publications many very remarkable examples of the former—persons losing daily all powers of vision at sunset—and, amongst others, that mentioned by M. de Humboldt, of a noble lady, the Countess de K——r, who lost her voice when the sun disappeared, and only recovered it at his rising in the morning.

By the variation of the relative position of the sun in the ecliptic, are produced the seasons; and by the seasons is the human frame greatly influenced. Statistical reports prove that the incipient life of the human being, as well as its death, are subject to their power.

Conception, in women, does not take place with equal facility at all periods of the year; the difference is marked, although it may be modified by climate. The same laws are only more inflexible in animals, because the circumstances of passion, and artificial temperature, are not, as with men, at their own command. However, the lower classes of society, whose propensities and whose circumstances bring them nearer to a state of nature, are more decidedly governed by the law of preference as to seasons. The end of the spring, and the beginning of summer, are the periods that in our climates tend, in a remarkable degree, to the increase of population. Taking for our guide the more correct reports of France, the most prolific months, drawn from accurate registers, may be arranged, according to the order of the relative number of births in each, thus:—March, January, February, May, August, October, September, July, November, June, and December. Since, then, the greatest number of births occur in March, January, and February, it must be obvious that the months most favourable to conception are, June, April, May, &c.

The tables of mortality in England have also shown that the preponderance in the number of deaths is regulated by the season—and that those months commonly considered the most fatal, are not so in fact. We sometimes overlook the circumstance, that the mortality of any given season is often only the result of the character of that which

immediately preceded it. If, as it frequently happens, an unusually cold winter succeeds to a very hot autumn, the same effects are produced as if we had suddenly removed from a hot to a cold climate. Reflections of this nature suggest salutary precautions.

The heat and light of the sun can scarcely be correctly separated—however, we will consider the former under the chapter of Climate. A few words only can be devoted to the subject of Light; and they are offered because people generally think so little of those phenomena around them, to whose influence they are habitually exposed. In the same manner that persons who are continually singing and talking, are the least aware of the importance of those exercises to the human economy—improving the health of those who have been condemned to silence and solitude, or killing those who suffer from diseases that require rest—so, those who enjoy the purest rays of light, are those often the most blind to its powerful effects.

It is not merely that the eye, anxiously accommodating its powers to its privations, and enabling the prisoner to distinguish objects in what appears to us the densest darkness of his cell, will be struck blind by the splendour of day when he comes forth—as many others are by the too vivid brightness of lightning—but the light of the sun appears, as it were, to feed the human body. Removed from it, the body grows pale, exhausted, and bloated; scrofula, and

many other complaints, depending upon a want of tone, are generated. In this respect we are not unlike plants, which we see, when forgotten in a cellar, grow blanched and sickly; shooting out rapidly their feeble and flexile stems, nor resuming any thing of their distinctive colour, until some leaf can expand itself eagerly towards the light of a crevice.

Among human beings, it is not, unhappily, those only who are condemned for their crimes to seclusion, who prove to us the injurious effects of the absence of light. The unfortunate beings doomed to work for us in the bowels of the earth, are living illustrations of this fact; but those who inhabit large cities, have still nearer evidences: in the dark and narrow streets and lanes—in the windowless houses—in dark kitchens and cellars—too many, particularly of the infantine and young, confess the absence of that influence, that imparts the beautiful hues to the human cheek, as to the varied creations of nature, and which, combined with heat, sets a distinctive mark on the natives of different parts of the globe. Considerations of this kind might lead legislators to pause before they exclude, by taxation, any portion of a blessing, which is indeed one of the vital principles of animated existence.

That which might best compensate the absence of this stimulant, is that which those so deprived, are least likely to obtain—abundant and nutritious food.

The effects of electricity on the human frame are very apparent—but it is not only when it strikes

some victim to the ground, that its power is acting upon us—we are constantly exposed to its effects, in every shade of degree. At the approach of the thunder-storm, and still more during those electrical states of the clouds, which so often occur without any violent explosion, men and animals are affected with peculiar sensations—uneasiness, heaviness, torpor, head-ache; and at such periods, persons of certain nervous temperaments cannot move out without danger to their health. Such is the effect of electricity upon the animal economy, that when the nerves which supply digestive energy to the stomach are cut, and separated from the source of nervous power, the arrested digestion of the animal can be continued by application of the galvanic current. Even after death, electricity exerts a wondrous power:—criminals, recently executed, are thrown into the most fearful contortions, by the use of the galvanic battery; bed-ridden patients, long labouring under most distressing and positive forms of disease, are reported to have been cured by the descent, and consequent shock, of the electric fluid, falling within the room they inhabited. In this manner, in 1762, a bed-ridden Kentish shepherd, palsied by an apoplectic seizure, suffering constantly from palpitations, convulsive and vertiginous sensations, was suddenly cured by an electric shock he experienced in his bed. The intimate relation which electricity bears to the animal frame, is readily conceived, when we find some animals, as the torpedo and rae, generating galvanism

or electricity, and possessing within themselves a species of galvanic battery.

Electricity, pervading all bodies in nature, has naturally become the subject of earnest and interesting inquiry, and it is only recently that its connexion with Magnetism has been distinctly traced and proved; still, doubtless, much remains to be known of it, in relation to ourselves. What has been already ascertained, however, is far from sterile in its application to the uses of life, were we to instance only the conductors, by which so many lives have been saved, both on sea and on land, and its application to the cure of diseases. In the former particular, its laws should be made an especial object of study. It is not many years since people were continually killed, by the habit of ringing the bells of churches to dispel the thunder. In 1718, twenty-four churches, in a small compass of country in Lower Brittany, were struck in this way by lightning, in *one night*. It has been estimated, that in thirty-three years, three hundred and eighty-six churches were struck by lightning in France, and one hundred and three bell-ringers killed. In England, and in our times, the same thing may occur; for we have recent examples of churches being struck, in an electrical state of the atmosphere, and persons killed, while ringing the bells for divine service.

Individuals, too, are still occasionally victims of their ignorance of the peculiar laws which regulate the accumulation or discharge of electricity—taking

refuge from thunder-storms under trees—creating currents in the air, by running, &c.

Sound is to the ear what light is to the eye: they both contribute beneficially to stimulate the human system, besides their important agency in the functions of relation. Sound, reaching the drum of the ear, excites the auditory nerves, which, carrying their impression to the brain, rouses it to a more active exercise of its function—that of conveying nervous energy to all parts of the body. Even in a healthy state of the frame, perhaps, if the brain were not kept alive by sound, light, touch, taste, and smell, it would lapse into impotency. Few, perhaps, consider the effects of these stimulants, light, sound, &c. on the body—that without locomotion, they exercise it—that, like other stimulants, they also exhaust it—that, when we have passed some hours with our bodies in repose, but our sight fixed on luminous objects, our ears taking in a constant succession and variety of sounds, we are fatigued, and require rest as much as if we had walked many miles. Hence it is, that in sickness, light and sound aggravate, or even occasionally produce, fever.

We cannot, in this early portion of our work, expatiate on the science of sound, and its effect, through the mind, on the nervous system—the enchanting and powerful influence which often, in youth, develops premature passions, and imparts to persons of delicate temperament, a morbid acuteness of feeling, at the same time that it refines grosser

characters—the influence, approaching to intoxication, which induces the Swiss mountaineer to desert his colours, and which, on the other hand, imparts such excitement to whole armies, that the field of carnage becomes the field of sport. Since we find domestic animals, reptiles and spiders, so acutely alive to the power of music—and have, in the *Philosophical Transactions*, a record of notes which greatly agitate even wild beasts—we may be prepared to understand some of its effects on man. Savage nations have been thrown into a state of frenzy, on first hearing European music. The chronicles of the time relate, that the Duc de Joyeuse, while his nuptial festivities were celebrating in the presence of Henry III., was thrown into such agitation by hearing the performance of a celebrated minstrel, that he drew his sword, and was restrained with difficulty from committing violence: his delirium yielded, at length, to a gentle strain of music.

Music is well known to impart energy, and convey relief, in muscular exertion. Troops who march in silence, are more easily fatigued, than when their step is regulated by the drum and fife. In some gymnastic schools of the Continent, the young athletes are made to perform their exercises to the sound of music, to diminish their fatigue. The rope-dancer mainly depends on it—the Canadian boatman, and the gondolier, seek instinctively to increase their energy, as well as lighten their labours, by their native melodies.

We shall only add, at present, that music has been

employed with success in the cure of some diseases—as might be proved, if our limits would permit us to quote the examples given by M. Bourdois, and others.

In addition to its effects on the mind and on the nerves, sound being produced by the vibrations imparted to the air, it is difficult at all times to distinguish and separate the modes of its action on man. The gunner has his ears frequently bleeding from the report of the cannon he fires—great concussions produce deafness—women miscarry at a distance from the spot, and other persons are killed. The fish die, and float on the surface of moats and rivers, near which sieges or battles take place. From an ignorance of these properties of sound, great disasters have occurred: generals have incautiously blown up their ammunition in a retreat, and numbers of the soldiers and inhabitants of the country have fallen victims to the sonorous percussion. In the writings of eminent military surgeons, will be found records of the spasms and agony felt by soldiers, in their wounds, or the stumps of amputated limbs, together with lists of the diseases that are aggravated, by the report of artillery, and which render men unfit for the artillery service, although possessed both of inclination and courage to perform its duties.

Facts are moreover recorded, that convey a still greater idea of sonorous percussion: the explosion of many pieces of cannon is said to clear a threatening sky from clouds and electricity, and to have dispelled diseases in the atmosphere—as lately is reported to have occurred at Warsaw, and formerly at Gibraltar.

CHAPTER II.

LAWS OF PROPAGATION.*

THERE is not a more interesting study, than that mysterious power by which we transmit to others the gift of life—nor a more awful responsibility, than the discharge of our trust. Still, human character presents no aspect more unfavourable, than its frequent recklessness in conveying to our posterity a principle so impaired, that the life of the new being is little better than a consciousness of disease. Let such an evil have its origin in its many other causes, we shall strive here to prevent its having its source in ignorance.

* In this chapter, we cannot avoid touching occasionally upon facts that are not fit for the contemplation of young persons of either sex. But our study is not intended to gratify prurient curiosity, but to inform persons of matured minds, who alone can enforce its applications, and who must already possess general notions on generation, however crude and unfounded they may be. In this chapter we must also have recourse to arguments drawn from analogies in the brute creation; but we think they can only displease those who are little conversant with philosophy. Philosophy imparts to a study, what dignity gives to the Medicean goddess, whose nudity is forgotten in the chaste majesty of her expression.

We, therefore, now proceed to make good a previous assertion—that there are natural laws, which enable us to influence and modify the propagation of the human species. Considering how positive these laws are, we cannot but repeat, with an ancient legislator, that it is passing strange, that as much attention is not given to the breed of men as to that of horses, dogs, and other brute beings.

With respect to the present subject, there are only a few points which legislation can reach. On all others, therefore, such instruction should be imparted, as may enable conscience and religion to supply its place. There is another power, of which we wish we could command the aid—which consists of the caprice of fashion in the rich, and blind imitation in the vulgar. Through its medium, J. J. Rousseau was enabled to compensate for the injury done to society by the immoral tendency of his writings. Having previously captivated the minds of his contemporaries, by the seductive charms of his “*Nouvelle Héloïse*,” and by his other writings, he produced the most salutary revolution in the physical education of the youth of his time.

The physical improvement or degradation of the race of man, like that of animals, appears to work, or revolve, chiefly on this one great principle—inheritance. Let philosophers revolt at the doctrine of the inheritance of evil, of which religion establishes the belief—or at that of property, which legislation has consecrated—it is certain, that inheritance, whether

of good or of evil, is the universal law of nature. If we look at a succession of men, nearly related—like the first series of the Roman emperors, so often cited—we find, if we may venture on the comparison, the same resemblance of feature (in their statues), and of disposition (recorded in history), that an Arab will show in the pedigree of a favourite horse. The noble features of better princes—those, for example, of the house of Lorraine, now reigning—no less resemble the portraits of their ancestors. Singular tribes of men, like the gypsies, have roamed throughout the world for centuries, unchanged in their lineaments, in spite of their intercourse with so many different nations—because habits, or laws, kept their marriages exclusively within their own caste.

Unions of individuals of different races greatly influence the breed. And, first, it alters the breed. Of this we have a striking instance in the union of the white and the negro. The mulatto, who derives his origin from the first admixture of races, is both whiter, his hair less woolly, he is straighter limbed, and at the same time more intelligent, than his African mother—the distinctive characteristics of the primary race continuing to diminish at each remove, although the creole will be able to tell you at first sight how many degrees one of the hybrid race is removed from his first origin.

Union of individuals of different races, improves the breed, and, as we shall presently repeat, increases the number of male offspring—a circumstance

which is always a proof of vigour, and a source of superiority.—An abhorrence, we might call instinctive, pervades mankind with regard to marriages betwixt near relatives. Although at first prevalent, from necessity, for the increase of the species, it has justly fallen under the anathema of the canon law, for it tends to the degeneracy, physical as well as moral, of mankind. Some tribes still inhabit the earth, among whom marriages betwixt near relatives take place: their women are comparatively barren, and their progeny dwarfish. If we select similar examples in modern times, either in this, or in Catholic countries, where dispensations are granted for marriages betwixt persons nearly related; or if we refer to passages in ancient history—to the age of the Ptolemies, for instance—we find they no less generally afford grounds for animadversion.

But in extending the same principle to any comparatively numerous, though still exclusive, class of society, the same remark holds good. We may perhaps explain from the sterility thus produced, combined with another cause we shall presently come to, the small proportion of families of elevated rank, that remain in Europe from feudal times, though their alliances and pedigrees were so honourable, and so carefully recorded. Towards the latter ages of feudalism, in the height of their aristocratic grandeur, a class of barons would marry only among their own kindred, and sterility struck them—whilst, in the earlier periods of nobility,

accessions were constantly being made to that rank, by intermarriages with bold soldiers, who had earned their spurs in the field. Were it not illiberal to attack whole classes of men, among whom are found some noble exceptions to the rule, we might specify the aristocracy of a now isolated country, among whom this exclusive pride, and constant marriage of caste, have degenerated their race, from one of the finest in Europe, to one of the most puny, in size and in intellect. We may perhaps fairly ascribe to the same cause, the imbecility which has been so fatal to some former royal dynasties: certainly, if the laws of nations, in consecrating the great and useful principle of legitimacy, had prohibited the alliance by marriage of princes in any near degrees of relationship to each other, they would have infused into it a principle of self-preservation. Now, differences of religion, and political tenets, often confine royal marriages within a destructive sphere.

The English nobility, less exclusive in its alliances, is perhaps the finest race of aristocracy in the world. The common beauty of the Turks, in spite of the counteraction of other habits, is attributed to their importation of the women of other nations. In this manner we are incited, by an admirable law of nature, constantly to associate larger portions of mankind, in a social compact of good-will and common interests.

The sway of this law in animals, is too well known to require particular mention here.

Even the vegetable kingdom acknowledges the power of the principle we advocate; and fruit deteriorates or improves, according as it is engrafted from a fresh or an exhausted race.

The human frame is so delicate, that, in our artificial state of existence, there are few individuals totally exempt from either some faulty conformation, some weak organ, or some predisposition to a particular disease, which accompanies him through life. These diseases, though too often hereditary, may still be combated. A long list of the most fearful might easily be given, but we will name only a few:—Madness, phthisis, epilepsy, cancer, scrofula, &c. They are all well authenticated, and worthy the study of those who feel the interest natural to parents in the happy establishment of their children, as also of the political advisers of those personages whose offspring are destined to fill the highest places among men.

The most illustrious families are not free from some such taint. Historians have remarked, that all the kings of the house of Valois were slightly tainted by madness. As we approach modern times, instances are innumerable—but we purposely close the book of record.

Our ancestors were not regardless of these subjects. Isabella of Bavaria, previous to her marriage with Charles the Sixth, according to Froissart, was submitted to an examination, to ascertain whether her pelvis was not deformed. Leprosy, then very prevalent, and other diseases, were formerly, throughout

Europe, considered a sufficient cause for dissolving the bonds of matrimony. The above-mentioned chronicler says, that nobody, of whatever rank, was allowed to marry, without having been subjected to an examination as to her fitness for the connubial state. In his quaint phraseology, the historian says, "Il est d'usage en France, quelque dame ou fille de gros seigneur, que ce soit, qu'il convient qu'elle soit regardée et épouvillée . . . par les dames, si elle est propre et formée pour avoir des enfans."

If it be acknowledged essential for persons in high offices to be possessed of every physical as well as mental advantage, it is no less important for other classes in communities, where, as we descend in the scale of rank, we find a greater demand on the bodily energies of men. In order to avoid what is indelicate in the mode mentioned by Froissart, of judging of fitness for the married state, it has been recommended to have recourse to an external measurement by compass, of the relative proportions of the different parts of the human frame; but, generally speaking, the eye alone possesses the needful compass, where its vision is not distorted by the caprice of fashion. How much better would it be, and how many artificial deformities might be avoided, could we create and preserve a true and philosophical idea of beauty—of that beauty which really consists in the fitness of the form of the body for the offices assigned to it!

The union of two very defective animals, produces a distorted race of some permanency. We have

heard that in Ireland, on the hills, where there are no enclosures, this accident became very useful:—A breed of crooked-legged sheep, with consequently little power of locomotion, was produced from the union of two crooked-legged individuals of the species.* There is little reason to doubt that in the human race, two persons afflicted with the same disease in a mitigated form, will produce offspring, in which the paterno-maternal defect will be considerably developed. The union of a weaker individual with a stronger, will improve the offspring; the disease peculiar to either parent will disappear altogether—or, remaining latent, pass over one generation, to re-appear in the next, should this latter become obnoxious to it, by the imprudent unions of the intermediate generation, or by their own unguarded conduct.

How many young and interesting persons, without any fault of their own—how many juvenile rakes, are seen, martyred and disfigured by the gout, from which their fathers, but not their grandfathers,

* If the observations of some travellers were correct, we should require still less assistance from analogical facts. The Chinese, it is known, frightfully distort the feet of their women of quality, with a view to produce, what they consider, an attractive diminutiveness—a mark or dignity—an excuse for idleness: and it is said that this deformity of the feet has become in a great measure hereditary, and appears in the children before they have been subjected to any painful process.—But these observations, although cited by a medical writer, have perhaps more of travelling than of philosophy to recommend them.

were free! a disease which occurs rarely in youth, unless it be hereditary.

It is worthy of remembrance also, that the outward changes of form, and internal disorganization, produced by the disease peculiar to certain districts in different parts of the globe, may probably be counteracted by the union of one of its inhabitants with a woman of a different village or county, as far as the offspring are concerned—one of the contracting parties having reached maturity far from the local influence; whilst the union of two natives of the unhealthy spot, can but increase, in a two-fold degree, the power of the original taint;—a reflection which shows the further benefit of the legal and instinctive repugnance to unions between kindred, by its increasing the probability of union betwixt persons living at a distance from each other.

The inhabitants of garrison towns have been generally observed to be handsomer, and better proportioned, than those of other cities;—the constant marriages with soldiers, men chosen for their height and strength, and foreign to the spot, counteracting the influence of a town life on the population, and improving the race by crossing of the breed.

That malady which has been called the retaliation of the New World upon the Old, for the cruelties inflicted by its discoverers, we must notice here, on account of the importance of some facts connected with

it. We would only observe, in this place, that it is communicable to the offspring, and that there is some foundation for the asserted fact, of such communication taking place from the father to the child, without the mother being contaminated. We have on record, from an able physician, some cases of the repeated miscarriages, at certain periods, of healthy women: on the recurrence of pregnancy in these subjects, he, suspecting a taint in their husbands, subjected them to a mercurial treatment—and at the proper period, they became the mothers of healthy children.

The malady in question is a ready and terrible ally of scrofula and consumption—and in England, where so many of the loveliest women are subject to the former taint, and where 60,000 persons die annually of diseases of the lungs, the observations and precautions we recommend, appear highly important.

It is a question that has not been propounded without reason, whether the tribunals that are called on to decide questions of separation between married persons, or married persons who appeal to their own consciences alone, should consult the mortified feelings of the diseased individual, in preference to the interests of generations yet unborn, and of society at large.

In addition to the more remote consequences already adverted to, there are immediate results, most appalling to the imagination, from the marriages of females of a certain defective conformation. The obstetric practitioner, in spite of the various resources of his art, may be called upon to crush and destroy the

human creature, at the moment when he is perfected—and when one ray of light, one inspiration of our atmosphere alone, would place him under the immediate protection of the laws, and make the man who should destroy him, a murderer. It occurs too, though less frequently, that the surgeon has to decide as to which of the two, mother or child, shall be sacrificed; and some times, both together sink under the Cæsean operation.

Do educated persons reflect on these facts? Should any false delicacy oppose our enforcing them?—or their painfulness prevent that contemplation which places a moral or judicial restraint on the contraction of marriages, which may be followed by such evil consequences?

We have laid more stress than usual upon this subject, from a deep conviction of its importance, and from the triumphant proof it affords of the value to communities, of studies like those on which we are engaged.

All physical peculiarities, in a word, in the parents, are hereditary; the *age* of the father is hereditary; and we may trace in the unconscious infant, even the lines of that care which is ushering the decrepit parent to the grave, but to which its happy age is as yet a stranger. Well might Horace say,

"Fortes creantur fortibus et bonis."

Men, old in years, or prematurely old, though sometimes destroyed by late marriage, have been though

to revive, as it were, by the contact of youth; and have frequently become fathers, when they had long been supposed sterile.* What the old husband gains, however, his youthful consort loses. Authors have observed physical changes in young women so mismatched, and a great deterioration in their health. We shall have to observe at a future period, the power of imitation in producing disease; but we cannot omit noticing here, that where human beings are, as in marriage, brought into the most constant and intimate contact, intuitive and involuntary imitations by one party, of the habits, infirmities, and nervous peculiarities especially, of the other, rarely fail to ensue. The effect which may be produced by keeping within the confined atmosphere of one diseased, or generating impure exhalations, will be treated of in our chapter on Effluvia.

These circumstances form altogether a subject of serious reflection to those instrumental in promoting

*In another chapter, the reader will find what Boerhaave and others thought of the advantage to old men of the contact of youth. As to their power of begetting children at an advanced age, numerous instances of the fact might be pointed out. Although the Roman law established that men could not have children after sixty years of age, we have daily examples of the contrary before our eyes. Schenkius has brought forward several examples of men having children at seventy and seventy-five years of age: Platerus, a physician himself, married, for the second time, at seventy-two years of age, and had a daughter born to him at eighty-two. Hufeland mentions an Italian baron, who was equally fortunate at eighty-four years of age, when he married his fourth wife.

such connections, although our limits do not permit us to do more than advert to them here.

Although our observations are, we flatter ourselves, of easy application, as to the prevention of the evils we have noticed, they are likewise intended to prompt individuals already suffering from them, to employ measures calculated to cure or arrest their farther progress:—1st, Parents conscious of the existence of disease, should avoid, by neglect or dissolute habits, to increase into activity, and thus render hereditary, infirmities which might otherwise remain dormant; and, in the next place, should adopt, with their progeny, plans and habits well calculated to destroy the propensity to the family complaint. These diseases manifest themselves, each at some particular period of life; scrofula, chiefly in its earlier stages—consumption, later—gout, later still—and so on.

A healthy nurse may probably correct the taint a child inherits from a diseased parent; and a consumptive tendency may be counteracted by timely removal to a warmer climate, &c.

It is a difficult thing to decide what hereditary diseases should be a bar to matrimony. Madness, present or threatening, with some others, are palpable obstacles—entailing present misfortune on the married pair, and the probability of future evil on society. It is not less true, however, that pregnancy has been found to be (in some cases) a cure for madness.

Consumption, as a disease which may be arrested

during pregnancy, only to put a term to existence soon, and inevitably, afterwards, should be an insurmountable obstacle in every well-regulated mind.

Epilepsy, as a transmissible disease, has been considered by many medico-legists, as a legal obstacle to marriage; yet some of the greatest men have been epileptic.

It is a misfortune, that many of these hereditary maladies produce in the afflicted individuals, a strong inclination to the married state; and some of them are thought to impart to women a far greater facility of conception. The sensual inclinations of idiots are well known, and the consumptive are observed to have, in general, a violent propensity towards that passion by which the species is perpetuated—a propensity which, when yielded to, not only hastens their own death, but leaves the deadly germ behind.

By suitable choices in marriage, the proneness of a race to disease may be diminished: the youth and strength of the woman will certainly wonderfully modify the offspring. One of the finest-formed women we ever saw, was the daughter of a nobleman of sixty-five years of age, formerly noted for his dissipation, and a martyr to its consequences; she was a young lady unusually developed in strength, fifteen years old.

Thoughtless persons are apt to attribute to what they vaguely call chance, or the caprice of fortune, what is really the most admirable manifestation of a

paternal Providence. The success and riches often obtained by men of inferior abilities and means, furnish an example of the justice of an all-wise Creator; in the same light may we behold the unions which occur between the gifted and the inferior among the human species, the ugly and the handsome. Some unexplained sympathy, some irresistible attraction, unites them; and by these means is the human race improved. Were there not some powerful counterpoise, the arbitrary fancies of human caprice would soon erect a barrier, and the ugly and unattractive be as effectually excluded, as though nature had set upon them a sign of reprobation.

The Christian religion, by consecrating monogamy as the law of the faithful, not only promoted the surer means of civilization, but also of the increase and physical improvement of the human race. Marriage, thus hallowed by the most enlightened of systems, produces, in its turn, all the elements necessary to the civil governments of states, and to their physical strength—an effect which no other union of the sexes can achieve. But to obtain these results, there must be a freedom of choice, and certain physical conditions, observed in the conjugal compact, most of which fall within the scope of our particular views.

Recent inquiries appear to lead to the conclusion, that, according as the strength predominates in the father or mother, the child will be male or female, and that infirm fathers generally give life to female off-

spring.* It would appear also, that in the great number of those hot countries where polygamy obtains, the number of female children greatly predominates; the fecundating power of the man is too much divided—his wives are sterile, or have a larger proportion of female issue. The proportion, so general and useful, in Christian countries, of twenty-two men to twenty-one women, does not exist there. While all efforts towards civilization are abortive, and the influence of woman on society is lost, it is not strange to see such communities remaining, as they do, for ever barbarous and stationary.

Should our remarks on the birth of females from debilitated fathers, appear to want confirmation, we may appeal to the analogy of comparative physiology. In the animal kingdom, do we not see more cows, ewes, hens, &c. than corresponding males of the respective species? and the reason is to be found in those habits that correspond to polygamy among mankind.

A reason has been before stated for the extinction of great families—the facts first mentioned may ex-

* This rule, like many others we mention, admits of innumerable exceptions. Natural laws are only cognizable to the philosophic student, in a field of wide and prolonged observation. They do not enable the finger of malice to point at particular instances, or afford aliment to conjugal recrimination. The Supreme Being, in the most healthy and moral of communities, has reserved to himself the manifestation of his will—and thus, while we see one family producing only sons, and another only daughters, in spite of the irregularities of numbers, the general proportion is still observed.

plain, perhaps, why they so often terminate in one female scion.

As it is often an object of importance, even in a political point of view, to perpetuate a race threatened with extinction, there are provisions made by the immutable laws of nature, to which resort may be had, whereby the probability of male offspring may be restored, and which should be allowed to supersede the objections raised by prejudice and ignorance: they have been sufficiently pointed out in this chapter.

The decline of states, as well as of families, may be generally traced to the same source; after the exclusive pride which deteriorates, supervene the luxury and licentiousness which extinguish, a race of men—reducing them gradually from a noble and warlike community, to a diminutive and effeminate set of beings, obliged to trust for their defence to hirelings, until they become eventually the vassals of their own former slaves, or of stronger invaders.

CHAPTER III.

LAWS OF PROPAGATION.

THAT which distinguishes the union of man and woman from the instinctive passion of the brute creation, is the predominance of mind, and the combination of its purest affections with personal preference and desire. On these feelings mainly depend the number and beauty of the progeny, and to these causes some have assigned the general superiority in strength, &c. of the first-born over the succeeding children, and the origin of the law of primogeniture—the eldest-born of a family being supposed to participate, in that respect, in the advantages generally assigned to illegitimate issue—dating their existence from the first ardour of affection between their parents.

The marriages arranged among the higher classes, from motives of convenience or family interest, are seldom so prolific as those founded on mutual choice.—The offspring, too, of those whose minds are absorbed and agitated, either by the pursuits of ambition or of science, are both less numerous and less vigorous than those of others, whose brains consume

not so much of that nervous power, that vital essence, which is as oil to a lamp.*

That the imagination exercises a very powerful influence on conception, is proved by a singular example given by Darwin:—A country gentleman, being much enamoured of the daughter of a farmer on his estate, was unable to conquer her virtuous scruples; but her image being constantly present to his mind, his wife conceived and bore him a child, whose features presented a perfect resemblance to the object of his affections.—The extraordinary resemblances which sometimes occur betwixt children and the friends of their parents, might thus, perhaps, bear an explanation somewhat less derogatory to their honour than is usually given to the impression of a familiar face.

As a distaste of either party for the other will lessen the probability of issue, so will hatred, it would seem, prove an insuperable bar. In vain the hated tyrants of Florence, the latter Medici, had recourse to every method to perpetuate their line; they have bequeathed to the world nothing but a warning, and the remembrance of a name. The extinction of their family has been ascribed, by various authors, to the above cause. How potent the principle of hate is in producing sterility, may be better understood if the preceding observation be contrasted with proofs, to which

* Vide examples in the work of Cabanis, "*Rapport du Physique et du Moral*."

we can only allude, of the facility of conception in women. On this subject we refer our readers to the great physiologists, Spallanzani, J. Hunter, Fodéré, and others. Fodéré relates an instance of conception in a state of profound lethargy resembling death—the circumstances of which, although they have been made the subject of a novel, are unfit for the generality of readers. It proves, however, incontestably, the possibility of conception in a passive state.

But all the violent passions disturb or prevent fecundation: violent anger has been particularly mentioned. Extreme excitement at that moment, is not natural in the gentler sex—lascivious women are sterile; and we have here another reason why the common courtesan is barren. It has been calculated that two thousand prostitutes produce but two or three births per annum.

Many exaggerated opinions were formerly entertained as to the production of children with particular marks, as well as monsters, from the excited fancy and panics of women during gestation. The cotemporaries of a learned cardinal ascribed his erudition to his mother having had a great longing, whilst pregnant, for the possession of a library, &c. &c. But as sudden fear and violent surprise will produce abortion, so will lesser degrees of excitement or depression produce these following effects: by causing the fibres of the uterus to contract, loosen the connection betwixt the child and its mother, stop the full circulation of blood to the fœtus, or determine it in too great a

volume to the womb, &c. These causes appear sufficient to render the offspring imperfect.

Authors of the greatest reputation have mentioned instances that refer to the previous reasoning, as proving the nervous tremors, &c. produced by accident on the mother, being conveyed to the child. Mauriceau relates that a lady, on hearing of the death of her husband, brought forth an eighth month child, who preserved through life the nervous tremor his mother was affected with during parturition. Pinel relates, that out of ninety-two children born after the blowing up of the arsenal at Landau, in 1793, eight were affected by a species of cretinism, and died before the expiration of the fifth year; thirty-three languished through a miserable existence of from nine to ten months' duration; sixteen died on coming into the world, and two were born with numerous fractures of the longer bones.

Before we draw conclusions as to conduct from the above facts, let us see what examples nature and men of other times and nations have given us. Whenever the human being is called upon to perform some important duty of his species, kind nature has surrounded him with a particular Providence. Women are generally most healthy during pregnancy, and less susceptible of great diseases, in conformity to a law which will not readily allow of two powerful actions going on at the same time in the human system. Even previous diseases are often arrested during gestation. How frequently do we see young females la-

bouring under consumption, inspire the most confident hopes when married and pregnant—bring forth happily at the appointed time, then droop again and die, when they have added to the sum of regret, the dearest links that death can sever. Pregnant women are likewise known to be the least susceptible of those contagious and epidemical scourges that ever and anon ravage the world.

An author even relates three instances of children dying in utero of the plague while the mothers remained uninfected. This, however, appears apocryphal.

Following this example of nature from olden time, legislators have endeavoured to surround pregnant women with a respect and indulgence that might prove their protection. Lycurgus considered a woman dying in travail as equal to a warrior dying on the field of battle. At Athens and Carthage, a criminal escaped the dread sentence of the law if he took refuge under the roof a pregnant woman. In Rome, women so situated were exempt from rising at the approach of the chief magistrates. The Mosaic Law condemned to death whoever by ill-treatment caused the abortion of a woman, and allowed pregnant women to eat of prohibited viands: the Catholic religion absolves them from fasts. In Copenhagen, regulations of police prevent women from being exposed to seeing persons exceedingly deformed or diseased—those, for example, whose faces are disfigured by syphilis or cancer, the epileptic, &c.

Our habits should undoubtedly continue the protection and care prescribed by obsolete laws, yet how differently do we find women surrounded, in the higher classes, and with all the sensitiveness belonging to our present state of society! Encompassed by aged nurses, with their fear-stirring stories, and dreaming of nothing but monsters; by men, (and a few uneducated medical men cannot be excepted,) who constantly speak of gestation as if it were a disease—producing in women a vague fear that antagonizes the full development of the fœtus, and bringing on sudden and fatal failures of vital energy in parturition—like that which deprived England of a princess, the object of her fondest hopes, and who might have been the mother of a long line of glorious sovereigns. With these notions, exercise is proscribed, bleedings and unnecessary remedies without number are encountered—parturition is considered as a process of the utmost difficulty, as if the existence of the whole human race did not prove the contrary—and pregnancy, a proof in itself of bodily energy, has as many remedies as the tooth-ache; equally infallible, if they terminate in due time, in the removal of the cause.

We must not forget the proofs we have, how much more sensitive is the nervous system of women than that of the other sex. Esquirol states, that the proportion of epileptic women to epileptic men is as two to one, and another nervous disease, hysteria, is, with few exceptions, the sad property of the former. Although pregnancy, and its termination, should never

be treated as a disease, the difference of women in polite society, and in a state of nature, is known to the most superficial observer. Our women could neither resort to a bath in an adjacent river; after labour, nor leave their lords to enjoy the luxuries and honours of the "confinement," as is customary amongst some untutored nations.

Without; therefore, repeating any hackneyed homily, we must state it to be the imperative duty of women, during pregnancy, to retire from the more agitated current of society; to avoid perfumed boudoirs, or those where flowers are shut in, particularly at night; the deteriorated atmosphere of crowded rooms; not to reside in houses in low situations, but to take constant and regular exercise where they can breathe the purest ether; avoiding the reading of books which agitate the passions, and the society of attendants, whose ignorance finds no pleasure but in the contemplation of extravagant and monstrous events.

Before we part with our present lucubrations, we must add some observations to those previously advanced on propagation, although it may involve some slight repetition.

As we ascend in the scale of animated beings, nature is found to be more and more chary of generative multiplication. In this we see, not only the value she sets upon us, as a most important creation, but also her motherly care; for, if most tribes of animated nature did not produce in a far greater propor-

tion, life would only present a short struggle against starvation. Those animals alone are of rarer and slower propagation, which might have contended with man for the mastery of the land.

Considering, on the one hand, population as the great source of power; and, on the other, the difficulty of human procreation, and the moral and physical causes that curtail infant life; the means of influencing propagation, of combating sterility, and of producing numbers of healthy and available subjects, has been an object of the deepest interest and reflection to legislators in every age. As we have observed elsewhere, even in the most densely-peopled countries, the same vigilance must prevail. A falling-off in the rate of increase of population, can only arise from a diminution of marriages, which cannot fail to be attended with some evils; and propagation must still be watched, to prevent the birth of diseased individuals, who burthen the energies of the healthy. The well-founded reasons for fearing the increase of children, generally diminishes in the more opulent classes of society, and with many of its members the wish to perpetuate their family is notoriously the object of their most passionate desire.

The importance of the subject of population, which induces us to add a few words to this chapter, is well illustrated by the laws of olden governments.

The Spartan law forced the sexagenarian to have a substitute in the conjugal rite, when he married a

young woman, and carried its scrutiny even to prescribing the dress for pregnant women. Valerius Maximus records some laws of Numa Pompilius on this subject, with the punishment of women who neglected, from the vanity of preserving their personal charms, the conjugal rite, and the peculiar oath which the Roman bride was compelled to take at the temple of Juno. To remove a certain heinous obstacle to marriage, Augustus laid a tax on unmarried men, and Constantine, at a later period, ordained a severer punishment, both of which seem to have proceeded principally from a politic motive. In the Latin historians themselves, or in Montesquieu, who has extracted from them examples, many other laws of the Romans may be seen tending to the same object. In Christian times, the refuge of the altar for criminals was, perhaps, not without a politic motive of the nature of that under present consideration. Under one of the kings of France, the whole of Paris was constituted an "asile" for criminal persons; a resource for keeping up population, which appears less extraordinary when we behold the greatest power of ancient times, and, in the present, flourishing colonies originating from the assemblage of outlawed men.

An important consideration is, the period at which persons of either sex should enter into the connubial or married state. Many, perhaps, would consider puberty to be a sufficient guide:—but the age of puberty depends on the sex, and, as we shall see at a

future part of this work, varies according to climate. Besides, neither man nor woman is perfected in the physical frame at puberty, as the mere instinctive creature is. Unlike the latter, the time of puberty depends upon education, on the presence or absence of those stimulants to passions which civilized life so abundantly furnishes. The consideration of the period at which marriage ought to take place, has consequently created a great dissonance of opinion. Hesiod and Plato assign the age of thirty for men, and of twenty for women, as followed in Lacedemon; Aristotle, thirty-seven for men, eighteen for women. Modern codes have otherwise fixed the period of legal marriage. Whilst such is the opposition of sentiments, there is still no doubt of the magnitude of the subject: nations that have conquered others, have generally paid it the greatest attention; were we only to mention the ancient Germans, whose solicitude in this respect Tacitus has conveyed to us.

There can be no question of the injurious effect of very early marriage, both upon the married couple and their offspring. We have the more palpable and best known examples of such results, in the short-lived and imperfectly civilized nations inhabiting warm climates, and in the marriages of princes in Europe. Having obtained a dispensation from the Bishop of Tours for that purpose, Lewis the Eleventh, not fourteen, cohabited with his queen, twelve years of age. A writer has inquired, whether this early initi-

ation in the rites of marriage was not the cause of this sovereign's well-known defects in after time. We might also ask, whether it was not also the cause of the debility and early death of his son, Charles VIII.

As the stage of complete physical development of each individual differs according to so many circumstances, the case of each individual will require separate consideration. The question must remain more for parental authority than for law to decide, and the former should be enlightened by the advice of competent science. Certain conditions premised, to prevent an imprudent increase of population, the evil most pressing is, perhaps, on the contrary, that of late marriages. Every man owes it to society, not to contract the responsible task of paternity, first, before his physical powers and his moral experience are sufficiently developed; and next, before he has acquired a sufficiency of fortune: but procrastination beyond that period is productive of serious evils. The early life of man is scarcely ever free from that promiscuous intercourse that injures his frame, and society is burthened by the infirm offspring of too tardy a moral reform, and of premature or positive old age.

The frames of the female part of the community begin at a certain period to assume more and more of rigidity unfavourable to the office and function of maternity; they should, therefore, be married before they have lost their natural plasticity. We might adduce facts from comparative physiology, tending to prove, on the contrary, that the circumstance of having pre-

viously born well-formed children, maintains in the organs of the female that mould of form that will enable them to have offspring of the same character on any new union with a different person, and one not favoured by nature.

Of late years, several authors, and particularly MM. Benoiston de Chateauneuf and Villermé, have added much to our knowledge of the laws of generation, by sterling facts derived from extensive observations. They have confirmed our opinions on the subject of the good effect of regularity of habits, of sleep, of generous diet, and of gentle exercise; of abstinence for a time, from the conjugal rites, and from over-violent exercise, and over-strained and continued efforts of mind, &c. in favouring propagation; and also the injurious effect of obesity, which is observed in men and animals artificially deprived of generative power.

The authors above mentioned have also extended their views to the causes that act upon the whole mass of a nation. They have proved the decidedly controuling power of certain months of the year; and that the end of spring and beginning of summer are the most favourable periods of the year to procreation, as we mentioned before; that periods of abundance of provision, and public rejoicings, are equally propitious, whilst the periods at which the greatest number of marriages take place, are much less influential.

As to the inauspicious circumstances, they have found them in residing on marshy land, in insalubrious seasons, in times of contagion and epidemy, and of

scarcity, even in the partial abstinence from food in Lent, observed in Catholic countries;—the end of summer and beginning of autumn being the least productive months. They thus lead us to conclude, that whatever increases our general strength, favours procreation. We find also in these reports, that whilst towns are so unfavourable to health, and produce greater mortality, the seasons cease in them to have so great a controul over generation, and that the months have less disparity in the number of births. From these circumstances they have drawn conclusions as to the conduct to be adopted by governments and individuals, which we will not repeat, as we think the facts are sufficient.

We must not omit, that to married life are accorded greater health and longevity; moral and physical strength proportioned to its trials. But not to women is this observation so applicable as to men. In vain would rich bachelors flatter themselves that by living for themselves alone, they increase their pleasures, and within the narrow sphere of egotism, prolong and improve their lives. Dr. Haygarth has proved, by examination of the tables of mortality, that bachelors are shorter-lived than other men: Hufeland, Buffon, and others, have confirmed this fact—one that we feel not less disposed to enforce when we see how many beautiful women, possessing every desirable quality of heart and mind, are pining away their lives, far from those tender offices which they might so happily and usefully fulfil. Woman was created

because it "is not well for man to be alone:" and justly has it been remarked, that states tend to their downfall when marriages diminish in number. A glance at the comparative state of modern communities, or at the classical stream of ancient history, will justify this conclusion. In a moral point of view, the condition of woman is to be pitied, when she is debarred from the exercise of those soothing affections in which her gentle nature delights, and which, forbidden a natural expansion, turn to bitterness, or expend themselves on unworthy objects. But, as physiologists, we must also add, that there are wants and functions of the animal economy, that, though daily combated by moral feelings, and controuled by intellectual superiority, if disregarded, bring, but too often, such individuals within an eternal circle of diseases, some of which are the most deadly and painful in the nosology.



CHAPTER IV.

EMANATIONS.

WE have deferred to another place the consideration of the subject of the atmosphere, in its many aspects, and in its important relations to the life and welfare of man.

Here, however, we may premise the office it performs in regard to the emanations constantly arising around us. In this respect, Fodère has justly observed, that it resembles water, which immediately takes up, and becomes the vehicle of, all soluble matters that it can meet with.

At the same time, how large a portion of the materials of our sphere may the atmosphere act upon in this manner! since the fluid, the gaseous, the solid forms, are only comparative states of bodies, depending upon the degree of heat to which they are submitted at any given time, or in any given situation, and which varies constantly. Even what is habitually fluid in our planet, may be habitually solid in one further removed from the great centre of our system; and vice versa.

"The atmosphere of spots inhabited by living beings is, if we may be allowed the expression, but a confused assemblage of all that has passed from the solid to the fluid, or to the soluble state, through the agency of heat—of effluvia exhaled incessantly from the bodies which the air surrounds, penetrates; dissolves—odoriferous matter, consisting of numberless molecules emanated from perfumed bodies—water vapourised, or in a state of suspension—elastic fluids, constantly produced by new combinations—smoke, arising from the burning of so many different combustible bodies—of dust, thrown into the bosom of the atmosphere, by so many arts of necessity, and by friction;—all of which, carried away to some distant spots, are destined to become the nuclei of new bodies."*

But it is when the weather is warm, and the air charged with moisture, that the atmosphere performs most readily the office of taking up and disseminating odours and effluvia—a circumstance which renders the study of this subject peculiarly important in England, where dampness is so common, and sudden transitions of temperature frequent even in the greatest depth of winter. Few there are so unblest as not occasionally to have experienced the delightful fragrantcy of a garden, when the warm air has become moistened by the dews of evening, or of a fecundating shower. But fewer still of such as visit the haunts

* Fodéré, Vol. vi. p. 285.

of poverty have escaped the sickly odours that rise upon the damp warm air of the closer districts of the town.

Before speaking of the odours and effluvia of which the atmosphere is the ever-ready vehicle, we must not forget to observe the effect of those subtile molecules or particles elicited and thrown constantly into the air by friction of artificial processes of manufactories, &c. Dust, or minutely-divided substances, produce the most sensible and pernicious consequences, when inhaled constantly or in large quantities. The eyes, the mucous membrane of the air-passages, and the skin, suffer severely from dust, whether it be merely from the mechanical irritation, or from the peculiar pungency of the pulverized substance. Hence the workmen belonging to the numerous trades, in the operations of which a degree of dust is unavoidable, are so often affected with coughs, consumption, asthma, hæmoptysis, &c. In the large towns, a great improvement has been introduced in the streets—that which is called macadamization; but if care be not taken to remove, during wet weather, the loose mud of the surface before dry heat and the friction of carriages turn it to powder—if, during dry weather, the surface be not regularly watered, and that sufficiently to keep down the dust, during the whole of the day—if these precautions, we repeat, be not taken, the fearful annual average of deaths from diseases of the lungs, in the bills of mortality, will be inevitably increased by the irritation which the powdered granite borne in the

atmosphere, must necessarily engender in the respiratory organs.

Although not strictly within the limits of our present subject, we shall take this opportunity of observing the danger incurred by delicate persons going out in the evening of a hot day, when large macadamized streets are watered. The cold and dampness of the atmosphere, produced by the evaporation, may prove very prejudicial.

The evidence afforded by needle-makers and stone-grinders, would lead us to believe that dust reaches to the extremest ramifications of the bronchiæ. We may also mention here, "*en passant*," that it is not advisable for the consumptive to travel along dusty roads, and particularly in dry hot winds. This they are often made to do in search of health, amid foreign climes. At such moments they should rather reside amidst green fields at home, or only travel, if possible, by sea—a mode of conveyance notoriously and peculiarly salutary—or in weather when the roads are free from dust.

CHAPTER V.

EMANATIONS.

UNDER the impression of friction, heat, electricity, moisture, &c., numberless bodies have the property of throwing off odours more or less rapidly. Considering these as molecules of their substance, with which they part, philosophers have justly given odoriferous bodies as examples of the extreme divisibility of matter; a grain of musk being supposed capable of throwing off perfume for a much greater period than is given to the most favoured man to live. We shall lay the more stress on the latter circumstance, to show how much we should be on our guard against such of those bodies as are pernicious, since such is their diffusibility.

Obliged to glide rapidly over most of the topics belonging to this chapter, which is only introductory to the next, we shall, however, pause for a moment on the subject of odour. By investigating the least important of emanations, and showing the influence which even that may possess over the vital functions, an idea may be conveyed of the importance of exhalations in a more extended view.

One advantage which extra-professional people may immediately derive from lucubrations like the present, is the being aroused by them to reflections on the character of the nervous system; a just estimate of which is necessary to the comprehension of the three following chapters. *Nervous* is an epithet in general very vaguely applied; with most persons it means every thing and nothing—whilst others, who think themselves better informed, fancy a nervous disease to be one in which there is and must be a palpable disorganization of a nervous fibril or centre. Nervous affections, however, must, in every degree, be positive, and in relation with some source of influence, although mostly to be ascertained by coincidence of the presence of a cause with the production of the effect; for often there is not any perceptible physical change discovered in the organization of the nerves themselves, where it would be most expected.* A sudden and violent moral affection may cause immediate death, and is only a more violent agitation of the nervous system, than that which produces the blush of ingenuous youth. A concentrated morbid emanation produces, in some cases, sudden death;†

* The brains of persons who have died of madness, often present no perceptible disorganization, or only such as in other persons produces no effect.

† The reader has probably heard of an instance of a tailor suddenly killed by the cholera, in an epidemic, whilst in the act of mending a garment. In Mr. Fraser's *Khorosan*, several instances, nearly similar, are recorded.

and powerful odours may act in the same manner. It is not more astonishing that a strong perfume should occasion syncope, than that a small particle of woaroorra being introduced into the wound in the leg of a rabbit, the animal should lie insensible beneath the knife of the physiologist—or that a few drops of poison, being introduced on a man's tongue, or into his stomach, he should, in one instance, be violently purged, &c., in the other, killed—in either case, with no greater interval of time than is necessary (if we may so express ourselves) for the nervous system to communicate to the frame in general an indication of the presence of the poison. The phenomena of the nervous system have the greatest resemblance to those of electricity—from the rapid passage of the gentlest aura, to the transmission of electric fluid which occasions the most violent shock.

In the time of Boerhaave, marvellous attributes were assigned to the odoriferous principle; but human opinion, ever librating, like a pendulum, between two extremes, now either underrates or totally overlooks the influence of odours. The numerous experiments made on them by philosophers are forgotten, or remain unapplied; and the organ of smell is considered only as it contributes to the comeliness of the countenance, or to the communication of pleasant or unpleasant sensations. Nature, however, has not been less elaborate in this, than in other portions of the human body: the internal parts of the organ of smell, greatly convoluted and sinuous, are thus contrived to

expose a larger surface to the action of odours, the membrane upon which they act being near the brain, and communicating with it by peculiar and important nerves, &c. On the other hand, we possess abundant evidence of the ready and extensive diffusion of odours: the scent of some spicy and flowery lands is perceived at the distance of thirty or forty miles from their coasts—

“ And many a league,
Cheer'd with the grateful smell, old Ocean smiles.”

So minutely subdivided are odoriferous substances, that in some, as in those that arise from asafetida, each particle has been calculated to be of a volume of only the 381,000,000,000,000,000th part of a cubic inch. Still, as nature has given to our nervous system the power of appreciating so rare an emanation, and as some odours impart as much disgust as others afford pleasure, perfume cannot be merely an unimportant accessory property of bodies, bestowed on matter, as elegance of form is, to flatter the sense; nor is it only to serve as a guide—for some of the most agreeable odours perniciously intoxicate the senses; and some fetid smells, as from a sewer, &c. though unwholesome, are less so than the baleful, though scarcely perceptible, scent arising from some marshy grounds.* We might be led to suspect the importance of odour, from seeing how generally it

* It is not as yet ascertained that the smell-producing, and the disease-producing, influence or principle, are identical:

pervades all created matter. Not alone does the vegetable world, but metals and stones also, emit odour: but that which is most familiar to us, is the scent evolved from all animals—that by which the predatory beast discovers his prey, the blood-hound tracks his victim, and the sagacious dog of St. Bernard's discovers the traveller buried beneath the snow. The exhalations of men of the several quarters of the globe, are also different in smell. The traveller has unpleasant reminiscences of those peculiar to the Negro, the Indian, and the Esquimaux. In youth, the odour exhaled by the human body is positively agreeable, but it is too often succeeded, at a later period, by one unpleasant and noxious, and demanding the continual remedies derived from our refined habits. This again is found to increase suddenly into fetidity by the agitation of the darker passions, as anger and fear; and still more infallibly, from the first decline of health to the last stage of disease. The fetid odours thus arising from man, are justly supposed not to play an unimportant part in the "*mephitisme*" whose dangers we shall shortly consider.

An inherent odour appears to have been given to the higher order of animals, to incite them to sexual intercourse. Man, besides this stimulant, is excited to sensual passions by odours foreign to his system. This is then also one of the numerous characteristics which we have in common with the creature of mere instinct—circumstances not degrading man, but tending to the perfection of his physico-intellectual nature,

and sometimes adding to those passions which constitute his moral probation.

The luxurious and unmeasured use of odours has not ceased with the Pagan era, or in the Paphian temples; neither is it confined to the Zenana of the Eastern Odalisk; it is as much in vogue among ourselves, and in this country; and we therefore shall give a few, out of numberless examples of its pernicious, and sometimes fatal consequences. Our observations have already proved that perfumes are worse than needless auxiliaries to youth and beauty, and that they may add to the effervescence of early passion in those who are but little aware of the nature of the exotic charm—a charm the false prophet has not forgotten to place in his sensual Paradise, and poets in the bowers of Circe and Armida.

If smoking stramonium relieves asthma, and reclining on a pillow of hops produces sleep; on the other hand also, the occasionally pernicious effects of odoriferous bodies cannot be doubted. In a slighter degree it is seen in the fainting and head-ache produced by strongly perfumed flowers, in close rooms.

The unconscious apprentice of the chemist, when first pounding rhubarb and hellebore, learns by *experience* the properties of these drugs; their volatilized aroma purging him as effectually as if he had swallowed a portion of their substance. Snuff-takers, persons whose olfactory organs are rendered less sensitive by the constant use of a pungent plant, are frequently distressed by nausea, if some new perfume be

added to their snuff. We may conceive the effect that pungent odours must have on the susceptible nerves of the refined and sensitive, when we see the fury they produce in brute animals: it has happened sometimes in cattle fairs, that mischievous persons have scattered into the air pungent powders, by which the animals collected for sale were made so furious, that they have broken down all barriers, and escaped, after overthrowing in their mad career, men and women, tents and booths.

The reader has, no doubt, heard of the existence of a fever called hay fever, attacking delicate persons, during the harvest of that fodder.

Herodotus informs us, that the Scythians became intoxicated by inhaling the vapour from the seeds of a kind of flax; and modern medicine has observed, that the odour alone of hyosciamus, particularly when its power is heightened by the action of heat, produces in those who inhale it a disposition to anger and quarrelling.

The Dictionnaire de Medecine de l'Encyclopédie Méthodique (Tome 7, article Jusquiame) cites three examples in proof of it. The most remarkable is that of a married couple, who, perfectly harmonious and affectionate everywhere else, could not pass a few hours together in a room where they worked, without engaging in the most bloody strife. The room was thought to be enchanted or bewitched. At length it was discovered, that the whole blame of these terrible disputes was attributable to a large

packet of the seeds of *hyosciamus*, placed near a stove; and their removal caused a perfect restoration of peace.

Two persons sleeping in a granary containing the seeds of *hyosciamus*, were attacked by stupor and violent cephalagia; and two others in Saxony are reported to have become mad after breathing the smoke produced by burning the same seed.* Very strong smells have been occasionally supposed to produce epilepsy. The *malva moschata* causes, it is said, hysterical attacks—and the flowers of the *nerium oleander*, and the lily, have been fatal in more instances than one, after they had been long confined in a room. This took place on one well-authenticated occasion, among others, in England, in the year 1779.

To “die of a rose, in aromatic pain,” is an idea that loses some of its facetiousness, when we really find some young women (for example the daughters of Nicholas I. Count of Salin, and of a Polish Bishop, &c.) dying immediately after respiring the perfume of some heaps of those flowers, or of violets.

The rooms in which flowers are most diligently amassed by our ladies of fashion, are generally the smallest; it is in the elegant penetralia of the boudoir that they shut them up. The heat there is favourable to the rapid elicitation of odour from the dying plant—the atmosphere is scarcely disturbed,

* Gazette de Santé.

by a current, and seldom renewed—whilst, in their natural situation, the cooler air moderates the evaporation, and its undulation wafts towards us a diluted fragrance.

There is no occasion, perhaps, for farther illustration of the effects of vegetable perfume. Our readers must be acquainted, by report, with that tree of Indian climes, whose deadly character has become the theme of many a touching tale, and beneath whose poisonous shade the weary traveller sleeps, to rise no more. Nor are there many, whose historical recollections will not furnish them with instances of death among great personages, caused by perfumed articles of apparel:—The German Emperor, Henry the Sixth, the wife of Henry the Fourth of France, a Prince of Savoy, a King of Naples, &c. are stated, in the histories of the times, to have been killed by perfumed gloves, handkerchiefs, &c. Without vouching for the truth of statements which may appear too equivocal, they prove the popular opinions of mankind for centuries—and, if we reproach past ages with an excess of credulity, the times from which we have just emerged were not less marked by an universal scepticism: the pure truths of philosophy are to be found in neither extreme; and those who are really earnest in their search, must begin by discarding every preconceived prejudice.

Whether produced by the working of the volcanos, whose subterranean communications extend

under a great part of the globe, or from other causes, the earth itself, in many places, spontaneously throws out vapours and gases, the carbonic and sulphureous being the principal, and the most destructive to human life. The "Solfatara," the "Grotto del Cane," have furnished a hackneyed story to each successive traveller in Italy; but a more fearful exemplification appears to have been lately found in an island in the Indian Seas. Travellers have there come to a boundary of hills overshadowing a valley, within whose limits it appears impossible to live. The bones of men and animals bleaching, as far as eye can reach, in the sun, give fearful testimony of the character of this real Golgotha. All who have ventured there, soon unable to advance or retreat, have expiated their rashness or ignorance by immediate death.

A more home-felt evil is the gas that accumulates in coal-mines, whose victims, notwithstanding the invention of the immortal Davy, are still sufficiently numerous to impose it as an imperative duty upon the legislature, to inflict some punishment on the supervisors who neglect to enforce the use of the proper precautions.

The emanations of which we are now speaking, readily mix with the waters of the earth, and render some of them, as a general beverage, highly insalubrious—a circumstance of which we should be aware—though this is, in some measure, compensated by

the numerous springs, where affluent people go for health, and still more for pleasure.

We shall not speak here of the gases produced by artificial combination in the arts; we reserve this for another opportunity. There is one product, however, of artificial heat, to which we must advert. If, in a large town, we look at a ray of the sun falling from a closed window on the floor, we shall distinguish that it falls, as it were, through a gauze of dust—proving a fact, (which, by the bye, we should have stated elsewhere,) viz. the unfitness of large towns as residences for the consumptive, notwithstanding their more uniform heat. In rooms warmed by stoves, this dust is burnt when it passes over the surface of the heated pipes, and produces an atmosphere very insalubrious. This effect may be obviated by covering the exposed part of the stoves with porcelain and other substances.

The carbonic acid gas, producing asphyxiation, is frequently the cause of serious mischief on the Continent, where the sempstresses and other persons keep their feet warm by means of boxes containing cinders. It is also occasionally a mode of destruction adopted by suicides. Death also often surprises the unwary, when chimney, doors, and windows are shut, in places where a fire is kept.

The curious and powerful effect of gases on the human economy, is well worthy of study. Their palpable influence is easily felt, since at one time we see the most robust persons, when exposed to a par-

ticular emanation, thrown into a fatal lethargy—others, of the most serious character, when they have breathed another gas, thrown into convulsions of laughter, and performing the most grotesque antics. But emanations are often acting as invisible enemies upon our health and spirits, when we are least aware of them or their influence ; and if we have not discrimination to discover, and knowledge to enable us to remove, the cause, vainly shall we resort to every other remedy for our distress.

We shall not expatiate on several other emanations, comparatively unimportant, but no less curious, and in some instances of beneficial operation on the human frame—such as those arising from fresh meat, and other articles of food, to which our butchers and victuallers are supposed to be partly indebted for their portliness and good looks—singular instances, if well-founded, of the controul exercised on our bodies by surrounding media.

Before we proceed to the consideration of other more important emanations, let us see what is the principle which they assail.

CHAPTER VI.

EFFLUVIA.

To arrive at just conclusions on the subject of human effluvia, we must not forget the office which vitality performs in the living being. By vitality, we mean that mysterious principle which baffles all research, and must ever involve the art of medicine in some uncertainty—which quickens, developes, and circumscribes all the various forms of animate nature—which preserves each of them in its individual integrity, against the encroachments of the rest;—the same which endows an acorn with the primordial of the strength and majesty, and of the hundred years of an oak—which in a germ apparently of the same magnitude, only enfolds the ephemeral beauty of a flower—that, finally, which assigns his degree of perfection, and his term of endurance, to man. It is on this particular principle, which, we must be aware, is more or less powerful in different individuals, that not only the vigour, but also the purity of the body, must depend.

Let us consider, for one instant, the effect of its presence or absence. Whilst the blood is in the

veins of the arm, its globules move on in an unceasing stream, it is homogeneous and fluid;—the lancet is plunged into the arm, and the blood runs into a cup. Its constituents separate rapidly; the charm of vitality, which held them together, is dissolved. Here we have water; there, a coagulated cake; and in another place, the colouring matter. The whole mass ultimately, and not slowly, putrefies. It is, then, vitality which preserves the animal frame from this abject and complete submission to external agents; nay, even from internal ones, too; for it is found, that if a rabbit be killed instantaneously, the gastric juice destined to digest its food, will digest the tissues of its own stomach.

But it is only when life is completely withdrawn, that the human body tends to putrefy. Vitality, like another principle equally enigmatical—the mind—is liable to become either suddenly or gradually impaired; with this change, the septic tendency begins. Bad or little food, fatigue, want of air, light, or of any other element upon which vitality depends for its support, will, by diminishing its conservative power, abandon the body to the inroads of putrescency. Hence, from the moment it begins to droop, its effluvia become more and more acrimonious, until death deliver it up entirely to the ravages of putrescency. It is when vitality is affected, that the body throws out the most noxious effluvia, and it is particularly open to receive the germ of every foreign contagion. Thus, the virulence of one cause con-

spiring with that of another, it spreads through all classes of the community the disastrous and awful consequences of morbid influences. Such of the lower classes as are most subject to depression of vital power, afford a permanent hot-bed to the habitual contagions of each country, and an inviting resort to others, which either arise spontaneously, or are conveyed from distant lands by the intercourse of man, and add so awfully to the sum of disease and mortality.

Could, then, the vigour of the lowest classes of society be maintained, not by luxury, but by an equable supply of the necessities of life, earned by regular labour proportioned to their strength, epidemics and contagions would either sweep by innocuous, or prove comparatively harmless. This must be an additional incentive to the paternal care of governments, and to the charity of the affluent classes. Without this, legal enactments, whether for exterior or interior protection, must prove comparatively nugatory, dealing, as they do, with a power that travels on the wind, or is generated with most irresistible virulence, in the obscurest corner of a dungeon, or in the lowest abode of human misery. Without this, in vain will the affluent classes fence themselves round, and lock themselves up from the ordinary intercourse of the community. They will but have increased the sum of misery, and at the same time the momentum by which the disease will be enabled to reach them. Health and disease are

in immediate connection, as we have proved elsewhere, with good or bad government, general prosperity, or partial affluence. Nor should we forget, that selfishness affords no escape. Liberal ideas on these subjects are the result of civilization, and, generally speaking, the civilization of the globe may be measured by its tables of mortality.

The very protection afforded to us in nature, by the principle of life, is at once a proof of its existence and an illustration of its character. When putrefaction has reached its most pernicious stage, in any substance, the generation of myriads of animated beings commences, some visible to the naked eye, and still more only to be detected by the aid of the microscope. So common, indeed, is the generation of living creatures in putrefactive matter, that the ancients considered putrefaction as one of the causes of life. Thus, by the rapidity and extent to which animalcular reproduction is favoured by putrescency, nature endeavours to preserve us from its deleterious effects. In spots in the hot tropical climates, where, as soon as a certain degree of humidity prevails, the most deadly effluvia arise, on the fall of a shower, the rich mould appears vivified.

Having now a just conception of vitality, the reader must see at a glance how all the influences which we have considered must act in favouring contagious and epidemic influences. The additional office which we have assigned to the nerves of the senses

—of stimulating the brain to incite all the parts of the body to the more active exertion of their functions, and to a greater vigilance—is of course, for the preservation of its integrity, possessed in a still greater degree by the mind; since its throne is the brain, from which it directs all the voluntary movements of the physical frame. The depressing passions throw the whole nervous system into a state of languor, sometimes the shock being so great as to produce instantaneous death. The nervous power once violently depressed by the passions of the mind, the frame tends to generate or receive every evil germ, to foster and propagate it. A medical author, not wanting in learning and talent, has even endeavoured to prove that fear is the cause of epidemics; and, surely enough, if it is not the cause, it contributes greatly to epidemy and contagion. Amidst the numberless facts on which this assertion is grounded, we shall single one out of many instances. In 1811, three hundred Spanish prisoners were marched into Lyons; anger, shame, and sorrow at their situation, co-operating with the miseries of a long march, produced a violent fever. As they passed through the town, an effluvium rose to the tops of the houses, and when they had been confined in their prisons, a fever broke out which destroyed four or five a day, and attacked all who communicated with them. The same disease has been produced on other similar occasions—as for example at Dijons, when the prefect and his secretary themselves became victims of the contagion.

The reader may think that in this case "it is not proven" that the passions of the mind induced the disease, but that it might have originated in fatigue, and want of food and raiment. Even granting that, in the case of these sufferers, the state of mind was not the chief agent, history and medical statistics leave no doubt as to the power of these depressing influences. After great public calamities, as well as in consequence of private sorrows, destructive diseases often ensue—the loss of vital being consequent on the loss of moral energy.

As soon as some new disease is imported from abroad, or arises in some spot at home, from which it spreads through the community, discussions and contentions arise on all sides as to its having simply an epidemical character, or one that is contagious, or both. These discussions are important, and the contention of men and discrepancy of facts is so great, that we should be perplexed indeed, did not a simple reflection occur to solve the difficulty. The contagious, as well as the malignant character of diseases, depends mostly, if not entirely, upon the degree of vital energy, and the narrowness of the space, &c. within which those who suffer from it are confined. At Madeira, in the south of France, and elsewhere, consumption is deemed contagious, on account of the number of sufferers that resort to those parts. Authors have enumerated many other complaints which we deem non-contagious, as contagious under similar circumstances. For instance, Dr. Cleghorn and Dr.

Fordyce, both physicians of high authority in medical science, have considered the ague as contagious, &c. &c. Therefore it would appear that epidemics, like the cholera, may be *conditionally* contagious.

In the narrow streets, in the dark blind alleys, and small rooms, where human beings are found, of immoral and filthy habits, ground down, moreover, by poverty, labour, and misfortune—by every thing, in a word, that affects vitality—in such places it is that epidemics first appear, and then grow into *contagion*. If persons who can command comforts and conveniences, are attacked by the invading disease, its contagious character disappears, or no longer betrays itself, and then it is rashly pronounced to be *only* an epidemic, or disease from local miasmata, or influences.

There appears no limit to the violence of morbid power; sometimes it strikes down its victim with the rapidity of lightning, at others sweeps away thousands with the force of a hurricane; even in our temperate regions, we have lately seen 1600 or 1700 persons die in a night! In such a crisis, no one can think of the disease, but as an evil riding upon the wind—an epidemic; contagion, which there is no time to trace from individual to individual is forgotten. When, however, the storm is passed, and we can contemplate more calmly the wreck of life, it behoves us to derive from its examination precautionary rules for our guidance in dangers of more common occurrence. Should we neglect oc-

casions of studying disease on a large scale, of unravelling the intricacies of its history, of tracing out contagion where it is mixed up with the emanations from inanimate objects, we remain not only the blind slaves of system, but the ready prey to new evils. Unfortunately there are Christian as well as Mahometan fatalists, amongst men of the most justly esteemed abilities.

The shores of England were long threatened with the importation, through the medium of our constant commercial intercourse with Germany, of cholera; but its invasion was long baffled by the bulwarks of affluence, cleanliness, &c. At length, however, it reached our coast, and the history of its ravages at Sunderland, as given by Mons. Majendie, upon his return to Paris, is well worthy of an attentive perusal. When this account of the wretchedness of the inhabitants is read, let none be so bold as to deny that Hygiène is a study worthy of being cultivated in England. Since its arrival, the cholera has constantly followed the same course here, of selecting its victims amongst the lowest and most miserable.

The contagious principle has the peculiarity not only of being increased or diminished in power by the state of the individual who was last under its influence; but let it be confined within a small space, without dilution by a large admission of atmospheric air, and it will still maintain itself, and increase in violence. On one occasion, at Marseilles, porters, who had removed bales of infected goods from a ship,

were, upon opening them, struck down by the contagion. In the same town, long after a visitation of the plague had passed away, some persons, dragging out of a close corner, ropes which had been forgotten were once used to bury the dead, were similarly affected, and, on this occasion, ten thousand persons died. At Venice, a blanket belonging to a person who had died of the plague seven years before, reproduced the disease.

It has been found that in camps, where soldiers were not affected by a fever, supposed of a contagious nature, like the ague, if the woollen garments of the dead and sick were piled together, after a certain time they communicated infection to those who moved them.*

It appears often sufficient to confine men within a small space, without adequate air, exercise, food, &c. to produce a contagious fever, sometimes of the most fatal character known.

A sick deserter was concealed in a small cavern in the south of France, where the only air admitted was by a small door. Fourteen persons administered charitably to his wants during the twenty-one days that he lived: all these persons fell sick, and eight

* To the articles of apparel, &c., which have been used or touched by persons labouring under contagious diseases, the name of "fomites" has been given. It is found generally, as shown in the above examples, that articles made of wool are the most susceptible of imbibing and retaining the contagious principle.

died. The reader has probably read the accounts of the Black Assize at Oxford, in July, 1577. Many of the persons present in the court, when the sentence was passed, were struck by a deadly disease from the pestilential exhalations of the prisoners. At Exeter, in 1586, and at Taunton, in 1730, from similar causes, the same evil occurred. In 1750, the contagious jail fever, brought into the court of the Old Bailey by the prisoners from Newgate, produced cruel ravages amongst the audience; and, amongst other eminent persons, proved fatal to the lord mayor and two judges. It is well known that the greatest mortality occurs in ships when they are carrying out troops without commensurate accommodation.

We must here offer an important reflection on the above facts. We know that, by slow degrees, the human system accustoms itself to poison—whether these deleterious substances, such as opium or tobacco, &c. which are habitually masticated by the inhabitants of different countries; or those which the medical man administers to combat dangerous diseases. It is not otherwise with respect to morbid poisons. Placed in an atmosphere growing every hour more vitiated, a prisoner will live comparatively scatheless. The deadly halo that surrounds him, will only be discovered when he comes forth apparently well, and mixes with his fellow-creatures, whose lives are thus sacrificed. In a healthy community, let a person weakened by extreme poverty, debauchery, and filth, be attacked by a fever, it may assume at once the

most malignant character, and contagion arise, spreading rapidly to adjacent persons. Generally speaking, the atmosphere of disease only extends a few feet round the patient, and, with a little prudence, and recourse to anti-septics, the sick may be approached with little fear of consequences; and there is no plea, even founded on egotism, to justify neglect of the sufferer.—It is far otherwise, however, when many members of a family are united in the same room, as occurs amongst the poor, with no renewal of the air of the room. The atmosphere occasionally becomes so impregnated and altered during contagions and epidemics, that persons free from the reigning fever, and labouring under other diseases widely differing, will still require a modification of the treatment generally adopted in their different disorders.

The atmosphere once taken possession of by a reigning disease, every shade and degree of that affection will appear in different persons. The slighter degrees not showing so decidedly the characteristic features, by neglect or mistaken treatment, a slight and ephemeral indisposition may be converted into an attack of the greatest degree of malignity.

Men of strong constitution have lived a long time in hospitals, or other situations where deadly contagion or epidemic reigned, without taking it. Still their friends could perceive in them a state of vague and general oppression, a change of counte-

nance and of humour. Did some passion or moral feeling come to agitate them, they took the disease; or if they continued long within the range of its influence, they likewise took it. After they had ceased to be exposed to it, in many instances at a distant period, an illness has occurred, that could be distinctly referred to that source. It is well known how long after leaving Walcheren, military men fell ill of the fever: in some cases seven months elapsed before the attack. To this latent state of diseases in the human body, before their breaking out, the expression of *incubation* has been applied. Dr. Haygarth says, that out of seventy-two persons attacked by typhus fever, five were seized ten days after exposure to the contagion; thirteen betwixt the tenth and seventeenth day; forty-one betwixt the seventeenth and thirty-second; and in one case the disease broke out on the seventy-second!—The knowledge of these facts affords subject for much reflection. The *distant* result of imprudence, is the reason why patients so seldom trace their sufferings to their cause, and deride their medical advisers—why those who write on the unpalatable subject of Hygiène, appear like birds of night and ill-omen, needlessly intruding, and interrupting the sport of those who ruffle their gay plumage amidst the glitter and sunshine of civilized life.

A person not suffering from a contagious disease, may, in flying from it, spread it amongst those that were free from it. Whenever great bodies of men

are crowded together under unfavourable circumstances, the same description of disease presents itself—as is so frequently observed in armies, besieged towns, hospitals, and prisons. Animals themselves, when similarly situated, breed a contagious disease—as occurred amongst the horses confined under deck, on return to England after the expedition to Quiberon. Such diseases appear, on some occasions, to have exerted a malignant power on human beings, and countries to have at different times been ravaged by the effect of morbid agencies beginning with the brute creation;—a fact, if well established, of which governments should not be ignorant. Nor is this surprising, if we believe the recent accounts of fish dying in great numbers during the prevalence of the cholera; of domestic animals dying during the plague, from the contagion of their owners; for it seems natural to suppose, that if the diseases of men can be communicated to animals, the reverse should also take place. We observe daily, that a disease of cows is communicable by vaccination to men. Dionysius Halicarnassus and Livy have mentioned wide-spreading contagious diseases affecting mankind, which originated in animals.

As to the participation of animals in the morbid evils affecting men, although their effects may differ, we have the authority of Sir James Fellows, who says, that in the fever of Cadiz, canary birds died with blood issuing from their bills; and in all the

neighbouring towns afterwards infected, no sparrows were observed to make their appearance. Instances have been lately brought forward, of birds dropping down dead in their flight over towns affected with the cholera. Similar phenomena are recorded by Thucydides, in his description of the plague at Athens; and Lucretius has rendered the subject no less immortal in verse :—

*“Nec tamen omnino temere illis solibus ulla
Comparabat avis, neque noxia secla ferarum
Exibant silvis; languebant pleraque morbo,
Et moriebantur; cum primis fida canum vis
Strata animam ponebant in omnibus ægre:
Extorquebant enim vitam vis mordida membris.”*

Whether we examine life in man, in animals, or in plants, we find it the most delicate and susceptible principle. Life is only given to the most perishable assemblages of materials; and we may observe with Virey, that we find mineral masses, which are cotemporary with the primeval formation of the earth, unchanged, whilst human remains have altogether disappeared, or are completely altered. Let us then duly appreciate that lore which teaches us how to foster awhile the flitting spark of existence.

CHAPTER VII.

EFFLUVIA.

IN proceeding with this highly important, but by no means inviting, branch of our subject, we need scarcely for our excuse remind the reader of the peculiar character of useful knowledge: the road which it pursues, is not selected for its attractions. Many of our best ethical writers, it is true, of a strong sarcastic turn, (such as Swift,) have deemed it a fair reproof to human vanity, and a wholesome antidote to voluptuous refinement, to unveil those revolting features of our nature which that vanity would fain disguise. Such, however, is not our present object: nor is it in so jocular a mood as that of the French satirist, when he exclaims,

"Du Japon au Perou, de Paris jusqu'à Rome,
Le plus sot animal, à mon avis, c'est l' homme,"

that we now pronounce him, as regards his physical frame, to be one of the most impure of animals.

The excretions and colluvies of his body have an acrid and peculiar character, which, accumulated or concentrated, may destroy himself and his fellow-creatures.

Let us, for better elucidation of the subject, compare man in his civilized state, with other animals which conform only to the instinct of nature. Such as are, like him, gregarious, we know, are also for the most part herbivorous;* and the abodes of these, if domesticated, have generally nothing in them injurious or repulsive—even their excrements are inoffensive, unless accumulated under peculiar circumstances. We visit our favourite horses in their stable without any feeling of repugnance; and the atmosphere of a cow-house has been recommended as a remedy not disagreeable in consumption. Carnivorous animals, on the contrary, are mostly solitary and anti-social: their food, more precarious and difficult to obtain, would be a source of contention among them, if gregarious; they therefore generally live separate from, and avoid each other, nearly as much as they are shunned by the creatures on which they prey. The eagle, for his eyrie, fixes on the loftiest and most solitary regions; or, sailing on a current of the purest ether, thus purifies himself from the foulness of his repast.

From these examples let us turn to man, not only gregarious, but fixed and sedentary in his crowded habitation. His ingenuity, not content with ministering to his mere necessities, seeks to

*Some animals, such as wolves and crows, appear an exception to this rule; but their constant habit of loco-motion is a sufficient protection to them against their own impurities, to which man, by remaining stationary in his abode, becomes more obnoxious.

pamper his senses with the quintessence of the superfluous food commanded by the resources of his mind. His senses, on the other hand, so stimulated, betray him into an excess, for which his overwrought mental cultivation, generally attained at the expense of his physical powers, but ill prepares him.

The progress of science and luxury enables many (and among these such as are called upon to legislate for the benefit of their fellow-beings) to escape in great measure from the dangerous and disgusting effects which, in crowded localities, these peculiar attributes or emanations of man's body entail upon him.

In his lofty mansion, where a judicious ventilation admits through spacious apartments, bland currents of pure air, to play among exotic flowers, it should sometimes occur to the legislator, that the foul close air is destroying thousands who inhabit hovels, kitchens and cellars, beneath the level of sewers and ditches, with their foul contents, where any breath of fresh air is even carefully excluded, lest it should interfere with that warmth which is produced by the congregation, within a small space, of their numerous occupants.

It was not without reason Rousseau said that man was, of all animals, the least calculated for the social state. The expired breath of man is destructive to his fellow-creatures (when confined in a narrow and ill-ventilated apartment); the more so, as he consumes, on the one hand, the vivifying

constituent of the air, oxygen, and throws out another gas, viz. carbonic, that, far from supporting, extinguishes life; and this is combined with a particular effete animal principle, which we know only by its pernicious power on others; a power which has been supposed to be aggravated by the age of the individual from whom it emanates.

The difference of living with the young and with the old, has been often mentioned and recognised, at periods when refined habits of personal cleanliness did not pervade society. The breath and exhalations of young persons have long been supposed to be invigorating. King David, of old, availed himself of this influence. A votive inscription has been found in Rome, that speaks of the gratitude of a man who lived one hundred and fifteen years, by keeping in personal contact with the young. This curious fragment is as follows:—"Æsculapio et Sanitati L. Clodius Hermippus Quo. vixit annos CXV. Dies V. Puellarum anhelitu; Quod etiam post mortem ejus non parum mirantur Physica Jam Posterici sic vitam "ducite." Boerhaave recommended to an old man, a burgomaster of Amsterdam, that he should sleep betwixt two young persons (*puellas*), to recover his vivacity and energy; and the advice is said to have had its effect.* Although, however,

* "Capivavaccio dit avoir conservé l'héritier d'une grande maison, en le faisant coucher entre deux filles jeunes et fortes. Foresters rapporte qu'un jeune Bolonais fut retiré du même état, en passant les jours et les nuits auprès d'une nourrice de vingt ans."

we may consider these statements as overcharged, there is, at least, a wide difference between the breath, like "newmown hay," of an infant, and that of the adult, or still more of a sexagenary *gourmand*.

Men exhausting the vital principle of the atmosphere, and in return throwing out impure exhalations and noxious gases, and surrounded by artificial lights that do the same, certainly justify what has been aptly said of the atmosphere of a ball-room, that it differs only in degree from that which is most destructive to human life. All must remember, with feelings of undiminished horror, the terrible fate of one hundred and forty-six Englishmen who were incarcerated in the Black Hole at Calcutta, and of whom, after twelve hours' confinement, twenty-three only survived. All must have heard of the dreadful mortality in slave-ships.

It would be useless to multiply such instances of the effect arising from a crowd of persons, enclosed within a confined space from which the atmosphere is nearly excluded, consuming vital air, and poisoning each other with their breath. Yet we see that the conclusions which naturally arise from the above, are entirely overlooked. The large theatres are often abandoned by caprice; the smaller suffocate us with their crowds, without sufficient precaution being taken, even when some terrible epidemic may be committing most extensive ravages upon the population of the district. In the house where representatives and legislators discuss the interests

of the empire, neither decorum nor particular regulations prevent a crowding of strangers within the smallest space compatible with life. Generally speaking, no great sudden or palpable accident occurs—and those whose superior information should protect the inexperience of others, go away without thinking that they may have laid the foundation of future debility, if not of fatal disease. The performances, in close, insalubrious theatres, of course take place at night; and, mixed with respectable persons, who form the majority of the audience, may sometimes be found the most demoralized, inebriated, not to say the most impure and diseased, members of the community. How different the course pursued by the ancients!—although their amphitheatres were open to the air, or, when not so, only enclosed by cloths, and their performances took place in the day-time, still they had recourse to artificial rain, and to other means, for refreshing and purifying the precincts allotted to the crowd. When the cholera raged in Germany, the Emperor of Austria, who displayed on that occasion the most laudable spirit of self-devotion, and spared no efforts to remove the effects of panic, went in person to the theatre, to restore gaiety by his example. During the performance several persons were seized with cholera, from the pressure of the crowd. This example shows the necessity of precaution.

The theatres being thoroughly purified and ventilated, there is no longer any risk; and no

amusement is better calculated to remove the depressing effect of that fear we have spoken of as so greatly contributing to the extension of contagion and epidemy.

The human body readily supplies what the putrefactive process requires, warmth and dampness. The warm air and exhalations having a natural tendency to rise, it is near the ceilings of the theatres, among the crowded galleries, that the worst effluvia accumulate; so, in most houses not sufficiently ventilated, the summit of them is the most unwholesome. In the Hotel Dieu, in Paris, it would appear that the mortality is greatest in the upper wards.

On the Continent, councils of salubrity regularly inspect all the public buildings, and contrive and enforce all the necessary measures of purification and ventilation;—an example which it is truly astonishing has not been imitated in England.

The great desideratum, in order to prevent in crowded places the pernicious effects of human exhalation, is, a balance of currents of hot and cold air. In all putrefactive processes heat plays an important part, and on these occasions produces excitement, succeeded by relaxation of energy—rarifies the natural atmosphere—and causes a working of the septic principle. The great contagious diseases have, generally speaking, originated in the warmest parts of the globe, and are most destructive in temperate climates in summer and autumn, though we know that they may also exist at other seasons of

the year. The cholera, and other diseases, rage in spite of cold: the former is as remarkable in this respect, as it is in often travelling in direct opposition to the course of the wind, and even of the monsoon.

Although in general cold temperature beneficially controuls contagion, it may nevertheless, when very intense, or long continued, and more especially if combined with dampness, indirectly assist its progress, by reducing the strength of those whom it attacks. It depresses the powers of life; and the fatal consequence of such depression, we have already insisted on at large.

From what has been adduced we may conclude, that from the first decay of vitality to the last stage of putrescency, there is, as it were, but one continuous destructive process.

When life is extinct, all that once possessed it is subjected to rapid putrefaction. Before entering upon the subject of effluvia from dead bodies, we must pass in rapid review other somewhat similar processes injurious to health.

As to the acetous fermentation, which takes place in the manufacture of vinegar, we have no facts to offer; but the consequences arising from the fermentation of seed, of decoctions, and of fruit, &c. have their records of mortality. In England, the emanations from the beer vats have killed many individuals: labouring men, who have incautiously entered subterranean granaries, cellars, pits and wells, (particu-

larly those containing salt water,) long closed, have suffered, or been destroyed.

At a future period we shall more fully enter upon the consideration of those immense tracts of low marshy land found all over the world, where, favoured by warmth and humidity, a constant decomposition of animal and vegetable remains takes place. We shall find, that besides the noxious miasmata and endemic diseases, which there take their rise, contagions also have there their most favoured seat. So, in referring to Egypt, we find that the plague rages in low lands, whilst the higher country is comparatively free from the disease; and indeed, some have gone so far as to assert, that all the ravages of this fearful disorder, that have devastated the world at different periods, have originated in the fenny soil of Lower Egypt. But here we must observe, that the same causes of disease exist wherever animal and vegetable matter accumulates in low places, in a certain proportion of stagnant water: ditches, moats, shallow ponds, and artificial pieces of water, are more or less inimical to health. The holds of ships, docks, and ports, when neglected, have been long known to become frequent sources of malaria of great morbid power. If the masses of humid ordure, that are constantly thrown into the streets, in the quarters of a town where the poor reside, be not regularly removed, disease is likewise generated.

Accumulations of human excrementitious matter,

are also pernicious to life. The unfortunate labourer, whose office it is to remove it, frequently falls a victim to an incautious descent into wells of fæcal matter. Nor is this effect confined to these striking examples. Just as we see persons living near morasses, sinking, by almost imperceptible gradations, into the grave, without any well-characterized attacks of ague, the virulence of the effluvia of fæcal receptacles exerts, over health, as little palpable, although a no less positive influence. In a room of one of the large hospitals in Paris, a number of patients were suffering from vinereal sores. The visiting surgeon could not, for a long time, explain why those, whose beds were placed in a certain corner of the room, presented always the most serious symptoms. On further examination, this spot was found to be close to the temple of Cloacina. The patients being removed, and the place cleansed, all things took their ordinary course. Precautions on this score should not be neglected in London. Few houses, of the second rate, are free from the most nauseous smell, arising from the above source, in warm and close weather. Even the palaces of royalty and of nobility, are visited in this manner, so as not to be endurable. Kitchens, where many of the lower classes either work or live, are particularly exposed, and the food of their masters is not unfrequently tainted by the effluvia. The foul waters in many houses run, covered by a slight brickwork, of which the mortar or brick has been decomposed by the damp, immediate-

ly beneath the thin boards of the kitchens. The putrid fluid, either from these channels being choked, or from the sewers being often above the right level, are absorbed by the walls. It is from this cause we frequently see the walls of kitchens, as well as the wood-work, discoloured and mildewed to such a degree, that only on applying the finger, they crumble into loose humid fragments.

We must here take the opportunity of remarking the slender precautions observed with regard to houses, which are, in this metropolis, so rapidly erected, of loose and slight materials: they are occupied immediately they are built, and the bad and damp mortar alone is fatal to many delicate persons; the foundations are frequently not deep enough, or not properly vaulted, and are established on loose, damp remains of every description, that easily ferment. Nothing is more common, therefore, than to find in a healthy part of the town, a house, surrounded by others perfectly healthy, whose tenants are constantly labouring under slow fevers, scrofula, &c.

Two instances have lately occurred, the one in a school at Clapham, the other in St. Marylebone workhouse, where violent disease was occasioned by the state of sewers. A great number of children were attacked simultaneously; and in the latter instance, the cases were at first deemed and reported cholera.—Sewers cannot be too deep, nor the course of their waters too rapid. Privies should always communicate with the common sew-

er; and the matter in them not be allowed to stagnate beyond a certain level, without examining and remedying the cause. Houses should not be allowed to be built but of the best bricks and mortar, and on the driest soil possible, and should not be too speedily occupied after they are built. We know of a new house in London, where, notwithstanding every article of furniture was new, and the inhabitants of cleanly and refined habits, vermin were constantly generated on the walls; nor was it possible to remedy the evil by any common means: the plaster was pulled down from the walls, and the plague ceased.

Dung-heaps, of which the greatest part is vegetable matter, produce but little influence on our sensations; but, as they are often placed close to human habitations, extraneous animal remains and ordure are very commonly mixed with them, and then they become proportionally deleterious. The more heterogeneous the collection of offal, the greater the putrefaction and septic power. Hence the danger of allowing the contents of what are called dust-holes to accumulate, particularly when water has access to them. The morbid effects produced by the slime in ports, and in the holds of vessels, &c., are referable to the same cause.

We have abundant facts on record, of extensive diseases produced by the bodies of dead animals. St. Augustine relates, that one year, in Africa, the earth was covered with such a number of dead

grasshoppers, that, in the kingdom of Massanissa alone, eighty thousand persons died, and twenty thousand soldiers, out of thirty thousand, who garrisoned Utica. A great mortality took place in the time of Ambrose Parè, in consequence of the bodies of some horses having been allowed to remain for two months in a well, near the strong castle of Penè. The body of a stranded whale, in Holland, once caused a similar disaster. As a frozen bar of iron gives the same sensations as a hot one, so may opposite states of the atmosphere produce the same diseases. The dampness of climate is highly favourable to the rapid putrid decomposition of animal matter. On the contrary, animal as well as vegetable remains, are preserved by dryness. Travellers have found, in some places in South America, the bodies of the Aborigines, and of their conquerors, the Spaniards, still preserved on the old fields of battle, by the desiccating effects of sun and sand.

In England, the above topics are the more worthy of consideration, from the means resorted to in order to fertilize the soil. Besides dung, fœcal matter, dead fish, &c. are scattered over the arable land; and the more putrid, the more is the agriculturist pleased, because it is notoriously the more fecundating. This evil is, indeed inevitable; but it may and ought to be palliated, in some degree, by precautionary measures.

CHAPTER VIII.

EFFLUVIA FROM DEAD BODIES.

IN consideration of the habits that prevail in England, we have deemed it important to dedicate a separate chapter to the subject of the virulence of Effluvia from the Bodies of the Dead.

Although it is not immediately connected with the title of the present chapter, still, as we have constantly in view the object of Hygiène, we feel it a duty to begin by adverting to an occasional cause of death, connected with the rights of sepulture, appalling to think of, and which a due circumspection may remove. We have felt it the more imperative to do this, as one of the conclusions to which illustrative facts under this head might lead, in the minds of many persons, would be, the necessity of the rapid interment of the dead; and, unquestionably, in the case of a contagious disease, or one that rapidly decomposes the body after death, a wiser measure cannot be adopted. It fortunately happens, that, whilst on ordinary occasions, the decision, whether an in-

dividual has ceased to live, is open to error of the most awful consequence, the rapid decomposition of the corpse, under the circumstances previously mentioned, removes all uncertainty.

Before we show that accidents of this nature probably still occur in England, we may advert to the many instances on the Continent, of persons sacrificed by a premature opinion of their being dead. From Bruhier alone we learn the following facts:—"Out of one hundred and eighty examples of persons erroneously supposed to be dead, fifty-two had been buried alive; four had been opened after supposed death; fifty two had spontaneously revived after being put into their coffins; seventy-two were discovered to be alive, after having been deemed dead."

The delay which precedes burial in England, would appear sufficient to preclude the possibility of a person's being buried alive; but, as covering the lethargic, or apparently dead, with the coffin-lid, and still more screwing it down, may be attended with equally fatal results, death from premature interment, may occur in England as elsewhere.

The record of all who have been buried alive, in all countries and ages, would form a fearful volume, and strongly guard us against a too hasty presumption of death. Even in the time of Pliny, alarm had begun to be felt on this subject; and he dedicates a whole chapter to it. Bodies have been found in burial-vaults, which had turned upon their faces or sides—

which had bled—which had marks of self-inflicted violence upon them, &c. &c.

Surgeons have, through inadvertence, opened bodies, which have only parted with life on the application of the scalpel: this occurred to Vesalius. Again, in 1763, a clergyman supposed to have died from apoplexy, emitted a groan at the first incision of the knife by a surgeon deputed to investigate the cause of his death. La Place being informed of the circumstance, and asked what was to be done, replied, "*Gemir et se taire.*"

Persons may, moreover, remain very long in a state of torpor, without presenting any appearance of animation.

An instance, proving what latent energy may subsist in the human body, occurred in the family of a friend of the author. The nephew of this gentleman, a boy seven months old, was supposed to have died of a cerebral inflammation. The physician, on making his visit, found the uncle alone with the corpse. He examined the child, and supposed him to be dead, but proposed to the uncle (a gentleman of great scientific attainments) to try an experiment; to which the latter assented. A napkin was dipped in a saucepan of hot water, that was simmering on the fire, and then put round the child, which, notwithstanding, showed no signs of sensation. The child's feet were then placed in a bowl, and water from the fire poured upon them. The body of the child was then convulsed—

its eyes opened—and a day was added to its existence. On a post-mortem examination, matter was found upon the brain.

Every body is acquainted with the singular instance of an extraordinary resurrection recorded on a monument in a church of this city; and whoever is disposed to peruse many most marvellous and well-authenticated instances, will find them in Fodéré, and other authors, who have written expressly on the subject.

In the *Journal des Scavants*, 1749, we find it recorded, that a woman in 1745, after having been put into her coffin, being to all appearance dead, was delivered by artificial process of a child, which betrayed no more signs of life than its mother. This infant, when every means of restoration had apparently proved fruitless, spontaneously revived, after the departure of the medical attendant. He, on being recalled, had the mother taken out of her coffin, and having resorted ineffectually to every stimulant to bring her to life, left the house once more, recommending that means of resuscitation should be continued. Four hours after his departure, the brother-in-law of the deceased came to inform him of her recovery.

The absence of rigidity of limb, of extreme discoloration, of coldness, and incipient putrefaction, &c. that characterize death, are so many reasons why we should pause ere we consign the body to the grave.

Apoplectic persons, and others who have died suddenly, appear, for the most part, to have fallen victims to this serious error of judgment.

Honourable to the feelings of the nation, as all must consider the procrastination of interment in England, it is not without its bad consequences. The effluvium of a dead body, diffusing itself in a house, where the minds and vital energy of its occupants are depressed by sorrow, and where the distressed relatives, perhaps, refuse necessary nutriment, may produce the worst effects. To parry these evils, and the still more awful errors of interring the dead alive, a consultation of competent persons might be appointed to examine the dead, as soon as possible after decease, and decide on the measures to be adopted. The civil law of France has made an enactment on this subject, which, if strictly adhered to, would go far to prevent these three evils—crime, burying the living by mistake, and keeping the dead to infect the living.

So deeply and awfully have some people been impressed with the horrors of premature interment, that, in one of the old imperial towns of Germany, a plan has been devised and adopted, as a security against this, as well as the other evils we have enumerated:—Every person, after death, is carried to a well-ventilated room, constructed for that purpose, near the church; the corpse is warmly covered, and laid upon a table—the hands connected with strings, communicating with bells suspended in an adjacent room, where a watchman is constantly on duty. To ensure

his vigilance, he is compelled, every quarter of an hour, to advance the finger of a dial, which will only move at that interval of time. We relate this from recollection, which, however, is accurate in all essential particulars. Two persons were saved by this expedient.

The philosopher, who studies the errors of man, will not find the display of his passions least absurd, with respect to the disposal of the dead. The strongest-minded man may, after death, become an unresisting puppet in the hands of false sentiment, caprice, fashion, and superstition. If we deride other nations—if we smile at the Abyssinian, who, as soon as his relative is supposed to be dead, hermetically seals his mouth and nostrils, &c. &c.—we shall find also, upon inquiry, that many civilized nations are not less singular in other respects. The fulsome mummeries and inexplicable customs of some other European nations, though revolting to good sense, Christian humility, and belief, are, nevertheless, harmless pieces of vanity, compared with the pride, which, in this country, lays claim, at the expense of the living, to place and distinction, even for the tenant of the grave. For a striking instance of this pernicious absurdity, we need go no farther than the new church of M——. For the sum of thirty pounds, we may there purchase the privilege of poisoning the living, with the body of some departed relative. The body is laid on a trap-door, which (as an apology for the solemnity of “dust to dust”) is strewed with a little

sand. It then descends with its load to the bottom of the vault :—porters start from their hiding-places below, and as quickly disappear with their prize ; and when the noise and bustle of their operations have subsided, you are invited into the depths of this fashionable “Avernus,” to see the remains of your friend, duly exalted above the coffins of his predecessors. All that is indecorous at the moment, and prejudicial afterwards, may be avoided, by obeying, to the letter, the awful words of the service—(which convey more than one emphatic meaning)—“Earth to earth.”

Errors, such as these, fall immediately within the scope of our subject—but not all errors—not those which relate to prejudices against the examination of the dead, or to the dissections of the anatomist ;—prejudices that impede the advance of scientific knowledge, and have given rise to crimes unprecedented in the annals of iniquity.

All the civilized nations of antiquity have condemned the custom of interment in cities. Wherever he travels, the antiquarian finds in the environs of the great ancient cities, tumuli, necropolis, funeral temples, vaults, excavations in caverns, masses of masonry of the most astounding magnitude, such as the pyramids,—wonders of the old world, that appear to have survived the wreck of ages, to teach us an important lesson—a lesson, however, as yet unattended to in this country.

The mummies of Egypt, with their elaborate hieroglyphic legends—their preservation by gums, aro-

matics, and absorbent earths—offer us another example, how honour to the dead was made compatible with the safety of the living.* Sculpture has perpetuated the beautiful forms of urns; and classical history, the description of the funereal piles, whose cinders furnished their sacred contents. Among the Romans, the laws of the Twelve Tables bore “*Hominem mortuum in urbe ne sepelito, neve urito.*”

The neglect of such salubrious laws never fails to produce serious consequences. The Hindoo laws, of such high antiquity, prescribe the burning of bodies, before being thrown into the sacred river; which now being incompletely done, putrefaction is still generated, adding to the deadly effects of the marshes near the Ganges.

In farther illustration of this subject, we may cite the reports of the French physicians, Messieurs Hamont and Parriset, who were expressly deputed to Egypt by the French government, to investigate the nature of the plague. It is their opinion, that the very superficial mode of interment that prevails there, materially contributes to it. At almost every village, they found, near the habitations of the Arabs, mounds

* This custom amongst the Jews, in the time of the Redeemer, is thus alluded to in the Holy Scriptures: St. John, chap. xix. ver. 39, 40. “And there came also Nicodemus, * * * and brought a mixture of myrrh and aloes, about an hundred pound weight. Then took they the body, * * * and wound it in linen cloths, with the spices, as is the manner of the Jews to bury.”

crumbling away, and exhibiting the naked bones of those who had been buried in them.

In the whole of Lower Egypt, corpses are merely thrown on the surface of the earth. A hillock is raised over them, which is quickly demolished, or cracks in drying—while infectious vapours escape through the fissures, or flies are admitted to the bodies. The sting of these insects will subsequently produce pestilential tumours, of which many of the natives have been known to die.

Modern nations are no less decided, in their condemnation of the practice of interment within the precincts of cities. Their funereal monuments testify this, no less than those of the ancients. We need scarcely mention the Père la Chaise, near Paris—the Campo Santo, near Naples—the Vale of Death, near Constantinople, &c.

What a contrast do our English habits present! Cemeteries, in the most popular places, elevated, in consequence of their limited extent of space, several feet above the pavements—and coffins, so close together, that the sexton is compelled to probe the ground, before he begins to excavate, to see whether the soil is sufficiently decomposed!

But the interment in churches is even more to be deprecated, than all the circumstances we have stated. Vainly do the undertakers enclose the body in two coffins: supposing the lead hermetically sealed (as it should be), in the decomposition of the body, elements are envolved, and combine, of sufficient

power sometimes to burst, at others to corrode, the coffin; and the subtle effluvium escapes at a time when it has become most active, from long imprisonment.



"Non sempre i sassi sepolcrali ai tempi
Fean pavimento, néagl' incenso avvolto
Dei cadaveri il lezzo, i supplicanti
Contaminò."*

Churches are exposed no less than other buildings we have mentioned, to the generation of insalubrious atmosphere, when crowds are assembled together in the hot seasons of the year. When to this source of mischief is superadded the subtle emanations from the dead, what may not be the amount of evil, although perhaps operating at a remote period! Mr. St. John has remarked, "Our dead are interred in our temples, and putrid exhalations float, like a desolating mist, through those aisles which should be sacred to praise alone. Men feel a sinking of the spirit on entering them; but it is caused not by any accession of penitential feelings, but by inhaling a fetid, unwholesome atmosphere; and through life they associate a certain cadaverous scent with every reminiscence of a church."

* Ugo Foscolo—*I Sepolcri*. These lines have been translated thus:—

"Not in wise times the cemeteries dank
Were laid beneath the churches' floors, and gorged
Till the believers shudder'd at the stench,
Strangling the incense fumes, and kneel'd in terror."

We shall now give a few instances of the effects of effluvia from dead bodies.

In Dr. Johnson's work on Tropical Climates, we find, that a man dying in a ship then in China, and his companions taking his body to the banks of the river, to be buried, at the first stroke, the spade of one of the diggers entered a coffin, from which so strong an effluvia escaped, as to strike down the two nearest men, who ultimately died.

We cannot afford space to relate all the accidents of a similar nature that occurred at the beginning of the French revolution; when, on account of the insalubrity of the church and neighbourhood of the cemetery of the Innocents, the government determined to have the remains of bodies removed. M. Thouret himself, who was director of these operations, narrowly escaped death from a putrid fever which he contracted in the performance of his duties. Those who only refer to works of general literature, will find an interesting account of the accidents that occurred on this occasion, in M. de Chateaubriand's "*Genie du Christianisme*."

Three workmen died, who had entered the vault of a church at Montpellier, in 1749; a rapid flight saving a fourth, who had accompanied them.

The bodies in the burial-ground of St. Eustache, in Paris, were moved in 1749; and of a number of children, who were proceeding to the church, to be questioned in their catechism, some fell down in a

state of syncope, whilst others were subjected to other indispositions.

At Saulieu, in Burgundy, in 1773, and at Nantes, in 1774, great numbers of persons attending divine service were attacked with most serious diseases, in consequence of the bursting of coffins of persons interred in the church.

These, and numberless other instances that might be quoted, induced the French government to prohibit interments in the town ; and it was once in contemplation, to burn dead bodies, according to the custom of the ancient Romans.

CHAPTER IX.

EFFLUVIA.

WE shall now take a retrospective glance at the road we have so rapidly travelled in the three preceding chapters, dwelling more particularly upon parts which have not hitherto been sufficiently elucidated.

In addition to the remedial means suggested at once by the knowledge of the evils themselves, we have interspersed notices of the resources against many of them. There still remain many measures of the first importance, of some of which we will take a bird's-eye view before we dismiss the subject. But before we proceed, we may take this opportunity of observing once more, that we have not exaggerated the importance of Hygiène to the influential classes in England. In all other parts of the globe, death is more active and insatiate than in the British territories; for nowhere else are the resources of life so plentiful, or life itself so valuable to its possessors. It is on this account that the lower classes are entitled to expect, from the duties that bind their superiors to them, that the latter will

add to their sum of happiness and of existence, all the advantages derived from the advance of science. If England is to remain stationary, because she loses only one inhabitant in fifty every year, and a neighbouring country loses one in forty,—on the same grounds, the latter should omit all efforts at improvement, because some savage tribe, contending with a sterile soil and beasts of prey, for food, sustains a yearly loss of one inhabitant in twenty.

Educated persons, particularly official characters, should be familiar with the subject of contagion and infection, the better to preserve their country and their domestic circles from one of the greatest "evils that flesh is heir to." If, when a new disease appears, men of science split into contending factions, a clearsighted, well-informed person, but without the bias which is the result of an education exclusively professional, will be the best calculated to solve the important questions which these principles involve. To prove that such persons will be called upon to do so, we might state two instances of the obstinacy of professional men of the first character and abilities: both denied the contagious character of the plague; the first died in consequence of self-inoculation from a pestilential bubo; the other exposed himself to the contagion in a lazaretto, and expired, denying the existence of contagion—

"The ruling passion, strong in death."

In Egypt, an Italian physician treated diseases of the eyes by frictions of an ointment, in which matter taken from persons labouring under the plague entered as an ingredient. His *cure* killed thirty persons, by communicating the pestilence. Therefore, when "Hippocrate" dit Oui, mais Galien dit Non," statesmen must necessarily decide between them.*

It is at the moment when a new disease threatens a country, that the interference of the government is most called for; for, whenever a disease falls upon a new soil, its ravages are most terrific.

In 1493, when Columbus returned with his companions to Spain, and waited, with the report of his voyage, on the court at Barcelona, the town was so suddenly seized with an unknown disease, that general prayers, fasts, and alms, were enjoined, to invoke the Divine succour. Three years afterwards, the parliament of Paris issued an edict, for confining all persons infected with the disease to their houses, and preventing them, under pain of death, from communicating with their fellow-citizens. Later one of the most chivalric kings of France is said to have fallen a victim to this malady.

* We must, however, take this opportunity of observing, that the discrepancies of opinion amongst the medical profession, are greater in appearance than in reality. Like religious polemics, they create great agitation among adverse parties, and excite the astonishment of the world at difficulties which appear irreconcilable, but which, when properly sifted, refer to some unimportant or transitory doctrine, whilst the adverse parties are generally found to agree in all essential points.

of life, it prepares the way for the course of that very evil it was destined to avert. We have stated, in a previous chapter, how we think the contending opinions as to an epidemy having or not having a contagious character with it, can be reconciled.* Intercourse with persons and places affected, may be carried on by the sound in health, and in whom no predisposition to disease exists, for a considerable time, without any visible effects. But the cholera has most palpably illustrated the fact of a disease lying apparently dormant as to its more formidable attributes, until it has fallen on some wretched class of society, and has accumulated a momentum of intensity, which enabled it to rush forth in all its terrors on the community at large.

Strict measures of medical police, are all that governments can resort to when an epidemic has arrived, or a contagion is fairly established. We have, however, instances of very beneficial rigour during the existence of contagious diseases; for example, in the employment of military law.

In a pestilential fever at Malaga, (where, in a climate inclemently hot, the inhabitants are huddled

* As this subject is one which the world at large is fond of canvassing, it was, perhaps, needless to have informed our readers, that our creed, although partaken by many, is not that of a number of distinguished medical writers. However, they have the facts before them, and can form their own conclusions. The recent mortality in Paris will not favour the non-contagion principles entertained there.

together in close and impure streets,) the governor, a very severe man, caused the churches and places of amusement to be shut. Every thing which had been the property of those who had died of the disease, was burnt in the public square. Among the articles belonging to a man just deceased, which were carried out to be burnt, a wooden crucifix was found. Opportunity was taken from this, to inflame the minds of the mob. The governor was expelled the town. His successor allowed a free communication with the sick. All sanatory regulations were removed, and the crucifix exposed to public adoration. That which ensued, conveys an useful lesson : five persons who kissed the crucifix, died ; the disease soon raged with redoubled fury ; and the convents, healthy, while secluded from the rest of the community, did not escape a visitation of the scourge.

During the prevalence of a pestilential disease in a town of the south of France, the governor succeeded in arresting its progress, by keeping the inhabitants in their houses at the point of the bayonet.

How far such coercive measures as these would be compatible with the spirit of our free institutions, we shall not venture to decide. We apprehend, however, that if a suspension of the Act which ensures the personal liberty of the subject, has been justified by a great political crisis, so also, in the sudden visitation of some fatal and wide-spreading

contagion, measures of extraordinary rigour would meet with the concurrence of an enlightened community.

Government should be invested with the power of compelling, under severe penalties, the declaration of the fact of an individual being contaminated; and the removal of all the nuisances that promote disease. In the centre of cities, cemeteries should not exist; slaughter-houses should be removed to its suburbs, for, whilst they inure the idle lookers-on to cruelty, they contribute to the extension of disease, by the putrefaction of animal residue. Markets for animals, like Smithfield, should not be allowed to exist in the heart of a town. When great numbers of animals are driven to this market at the risk of human life, and with a loss of £50,000 per annum, from such as are killed or injured by blows, they poison the atmosphere with their ordure, mixed with all the impurities of a crowded street; and the meat thus deteriorated, cannot fail to be pernicious in its effects on those who partake of it.

The removal of masses and pools of filth—the enclosure of ponds so often found near towns, where boys drown animals, bathe themselves, and establish a receptacle for every species of filth—the cleansing and white-washing of houses of the poorest class, at the expense of the parish—are all objects worthy of the consideration of government.

The character of the poor and ignorant should never be forgotten. Like those of children, their

humours and caprice must be managed for their own advantage. How many people of the lower class will undergo any trial, rather than submit their children to vaccination! In some civilized countries of Europe, they are obliged to have recourse to rewards, and even punishment, to induce the inhabitants to submit to it. The same observation applies to the history of the first introduction of inoculation. After its comparative safety had been ascertained—by the representations of Lady M. W. Montague, and by experiments upon felons, who submitted to it as a sort of “commutation of punishment,” thinking it just better than hanging—the force of example was employed to conciliate the consent of the public; and accordingly, the next individuals who were subjected to inoculation, were some of the members of the royal family.

When a great epidemic or contagion falls amongst persons in a low state of civilization, the effect of dangers which they can neither fathom nor avert, is, to paralyse all their energies, as if they were labouring under some narcotic influence. To this state of helpless stupor, when familiarised to the horrors of their situation, and rendered desperate by the precarious tenure of existence, a fearful reaction invariably succeeds, and the laws of morality no longer restrain them from a total abandonment to levity and profligacy. Such is the picture uniformly presented by history, of a pestilence, where its progress has been unopposed by enlightened views and salutary discipline.

Of all circumstances, the most necessary to uphold the vital power, and protect the body from the influence of noxious agents; is, an abundance of fresh air. The poor, however, deny themselves this vivifying fluid. They find it diminishes the heat of their bodies, around which they preserve warmth by shutting in the steam of their own exhalations. It is only by their superiors visiting them, and supplying them with garments and fuel, that they will abandon such habits.

By legislative enactments, providing for the construction of streets and houses, the object of giving air to the community can in part be enforced—building houses only of certain dimensions, and of certain materials, with a good exposure in streets, laying open to the wind, and built at right angles. The tortuousness of streets, as well as their terminations by “culs de sacs,” prevents the free course of purifying and drying winds. In London, in many places, where the frontage of the house is well exposed, the back part is not at all open. There dust and soot accumulate; and if a plant be exposed, it soon changes colour, and dies. Streets lying parallel, very closely back to back, should not be joined by houses at their extremities, as it prevents currents of the atmosphere playing freely in those parts of human habitations, where the impurest of domestic operations are carried on. The want of elevation in the streets of London, has been with travellers a standing reproach to English architecture. In any future at-

tempt to remedy this defect, we must take care that the height of the houses be still proportioned to the width of the streets. They must not, as in towns upon the Continent, deny all access to the sun, while the mephitic air is engulfed between rows of houses, whose interspace is out of proportion with the depth of their shadows—a circumstance sinning no less against salubrity than against architecture itself.

Gardens and squares in the centre, and in different parts of large towns, form another important resource for health. Besides the inhabitants availing themselves of a larger allowance of fresh air, and of the office which the vegetable kingdom performs—in absorbing carbonic gas, during the day, the time at which it is most abundantly generated in artificial processes—children also have a resource for the development of their energies. A better understanding of religious duty should lead the higher classes to encourage the poorer, by every possible means, in agreeable exercise and amusements in fresh air, on Sundays and holidays, when the divine service and sacred duties of the morning are concluded.

Such would not be an ineffectual means of combating, in some measure, immorality, contagion, and epidemic influence, and last, but not less ruinous, inebriation—a vice corroding the very vitals of the poor, and producing most disastrous effects in a crisis of disease, as lately witnessed at Gateshead.

Now, that correct statistical reports are obtained, a glance will prove the greater mortality in cities, when

compared with that in agricultural districts: whilst, at the same time, every motive of interest, ambition, and industry, combines to drive the inhabitants of the country into towns. The crowds enclosed in cities sometimes exceed the population of nations, which once possessed kingdoms, and over which great sovereigns were proud to reign; whilst the external boundaries of towns are daily extending, their interior tenements increasing in value, and architectural ingenuity on the stretch to increase their height, depth, and breadth. Every ten or twenty years, the wealthier inhabitants escape from the close and morbid atmosphere to the suburbs—but there they are soon encompassed, and behold dead walls supplanting the fresh fields and trees. No laws exist, sufficient to modify the evil. Governments or parishes might purchase, at fixed distances from the centres of increasing towns, portions of lands, to form concentric circular walks and gardens—a resource for exercise, and air, and health, to the panting citizen and his family, of which he would soon acknowledge the inestimable value.

Those who have travelled in Germany, will scarcely forget the delightful boulevards which surround most of their larger cities. When in the old city of Leipsic, at the time of the great fair, forty thousand strangers, with their merchandize, are herded together with the inhabitants in the same precincts, men of all parts of the globe, and in every costume, are to be seen in the evenings, breathing the pure

atmosphere in the gardens that surround the town; and in this way is the sickness probably prevented, that might ensue from their situation.

In our days, with such augmented population, such open and cultivated spaces are as necessary to protect cities against disease, as ramparts formerly were to defend them from invading enemies.

Frequent ablution and purification with cold water, enjoined by the politico-religious codes of the Eastern climes, is also one of the best means by which weak persons in England may resist the vicissitudes of climate, and other causes of disease. Public baths should be established, (and the river offers a great facility,) at the expense of government, where persons of the lower classes should be allowed to go, and bathe, at the most trifling expense, under the controul of the police. This means of purification is highly active and important, in addition to the opportunity of teaching landmen to swim, and developing the muscular strength of old and young.*

Antiquity has left us useful examples as to public bathing. In some cities, dancers paraded the streets, striking their cymbals, and announcing to

* The "Ecoles de Natations," floating baths of the largest dimensions, are institutions found on the great rivers, in the large towns of the Continent. The Serpentine, with two or three feet of slime, is the only place in London where the lower classes can bathe, free of expense, and only before seven o' clock in the morning.

the public that the baths were ready for the weekly ablution. The remains of baths in Rome, and in other great cities of antiquity, constitute some of the noblest relics of the architecture and sculpture of the times; recalling not only the luxury and grandeur of the ancients, but also the high esteem in which they held Public Hygiène.

Many modern nations, in a far lower state of civilization than England, are most "recherché" in this respect. An example well worthy of imitation in England, is, a charity which exists abroad, of portable baths, (here too expensive, even for the middle classes to use them,) to supply, at the lowest price, warm baths to the poor at their own residences. How invaluable in a case of sudden disease!

By a combination of artificial heat and ventilation, purification is effected on the easiest terms. Artificial heat is one of the most important means of purification. It is but recently that Dr. Henry, of Manchester, has added to our knowledge of its powers: he has ascertained its power of decomposing morbid virus, and contagious matter; and the day is, perhaps, not far distant, when it will be applied to the disinfection of merchandize on the largest scale. Monsieur Parent du Chatelet has found that the application of heat to soups tainted by putrid effluvia, removes all their bad effects. The most inveterate gourmand could not bear his game or venison, were it not that a great proportion of the putridity is removed by the application of heat.

The diffusion of steam and of hot air through metallic cylinders, has added much of late years to the means of disinfecting human habitations. By warming the atmosphere near apertures at the more elevated parts of rooms or buildings, the expired and tainted air is led to rush out, whilst the currents of cold that supply its place, are sufficiently elevated in temperature, to produce no ill effects on the human body in winter.

As an inducement to those who keep large establishments, or manufactories, to avail themselves of this purification, we will add, that the warming of houses by steam, has many advantages. On a large scale, it will prove most economical. The heat it imparts is not partial, like that of a fire; the room is not exposed to the effects of down-draughts, bringing smoke, and producing injurious effects on our organs; lastly, the temperature is equable, and allows of regulation by the thermometer.

As a general means of purification, a bright fire is the best guarantee against the consequence of impure air; and human exhalations. The same resource is found to be most useful in ships, whose crews also derive much advantage from the well-known contrivances, by which currents of fresh air are conducted into the holds of vessels. When combined with the dews of night, currents of air have been found most serviceable resources for disinfection in pestilence, by the inhabitants of Southern and Eastern climes. This process has obtained a particular, ap-

pellation, "Sereinage," and has been employed to purify the clothing and bedding of the sick.

A singular instance is recorded, of the effect of a current of air, which, running betwixt door and window, divided a court of justice, in which prisoners with jail fever were under trial. Persons on the side where the dock stood, were assailed by the fatal contagion, and those on the other side of the current, escaped unhurt.

The subject of ventilation is one of the highest importance, generally little understood, and still more neglected; but to which we cannot now do justice. It cannot, of course, be overlooked, that the effect of the natural atmosphere on the sick, is not merely to carry away effluvia by its currents. Several authors have written on the absorption of nutriment from the atmosphere, by the skin and lungs. Some have thought, with Hufeland, that more nutriment is received in this way, than through the stomach.

Besides heat, and currents of air, there are substances that are known to possess, more or less, the power of disinfection. On considering the number of bodies that have been brought forward at former epochs, as possessing anti-septic power, we generally find they are thoroughly odoriferous, and, either in taking possession of the atmosphere, as it were, by their molecules, or by decomposing the septic effluvia, effect their object.

A question might arise here, in which of these two ways the vapour produced by burning wet straw, has

produced disinfection—as well as that caused by the incineration of forests, which appear to have driven away the cholera from neighbouring towns in Russia.

An opinion prevails, which appears not unphilosophical, that one of the reasons why even the manufacturing towns in England, in the state of the greatest wretchedness, have suffered so little from the cholera, is, their being pervaded by *smoke*. The latter may have produced the twofold effect of carbon and strong odours. It has been observed in Paris, that the cholera seldom made its way into the covered passages or arcades, whilst it raged around them. As the absence of free currents of air, and the number of inhabitants closely packed in those places, are circumstances unfavourable to health, men of science have attributed this freedom from cholera to the burning and the evaporation of gas, not so commonly met with in other parts of the town. Wherever we seek examples, we find the most decided power in an artificial atmosphere, to resist disease of which the air may become the vehicle. In the plague, the centres of towns have sometimes remained free from the pestilence. The tanner, the currier, the tallow-chandler, and other stinking trades, enjoy a remarkable immunity from many diseases. In the "*Annales de l'Hygiène*," will be found a report, showing the unexpected degree of salubrity of tobacco manufactories, when contrasted with our preconceived opinion, and with the decidedly narcotic and poisonous effect of this drug—only employed in violent dis-

eases, as an "ultima ratio," by medical men, and then with the greatest caution.

Most of older disinfecting agents and substances, are, however, far from meriting blind confidence; and, by masking the prevailing evil, often betray into danger: Strong aromatic vinegar would appear to be most valuable, as adding the character of an acid to that of an odoriferous purifier: Acids generally possess a highly salubrious effect in our present view of the subject. The vegetable acids are highly useful; and nothing is more desirable, than that we could furnish acidulous fruits to the sick and the poor, to obviate their diseases and effluvia. They appear to exert many of the beneficial effects upon the blood, which are produced by salt. This latter condiment—which is so useful in preserving animal food from putrefaction, and so essential to our digestion of nutriment, that deprivation of it was a punishment in former ages—has lately been discovered to be of the greatest effect, when administered largely in diseases which rapidly decompose the blood, as would appear to be the case in yellow fever and in cholera.

The mineral acids are substances by which the fatal effluvia of hospitals, &c. have been decidedly controuled. Guyton Morveau employed it advantageously in disinfecting the church of the Innocents in Paris, in 1789.

Of late years, Mons. Labarraque has brought forward the chlorides of sodium and of lime—anti-septic agents of the greatest power, in vogue all over the

Continent. The solution of these salts, with a little precaution, may be put into the hands of all for common use. By these may be cleansed putrefying substances of all kinds. In flat dishes, to favour their evaporation, they may be placed in the close galleries of theatres and churches, over the doors, so as to destroy the effluvia. Armed with a sponge, kept before the orifices of the air-passages by a suitable apparatus, persons may descend with comparatively small danger into burial-vaults, sewers, wells, and cellars, mephitic, from being long closed up, unless the mephitism arise from carbonic acid.

The use of the chlorides in Egypt saved the French physicians from the plague, which they were sent to investigate, and appears to have converted some of the Turks from fatalism. If the reader recalls the fact brought forward in a previous chapter, proving the pernicious effect of emanation from privies—and if it be remembered that other exhalations, to which we are exposed, are more potently deleterious—he will see the advantage of his occasionally using these disinfectant agents.

There is one fact, however, not to be overlooked as regards disinfectant substances which are volatile, viz. that they create an unnatural atmosphere around us. Most remedies in medicine are evils employed to counteract others of greater magnitude—and the disinfectants form no exception to the rule. As no atmosphere but the natural can suit our respiratory system, it has frequently happened that the volatile

disinfectants have produced mischief with greater certainty than the evil they were destined to counteract. Their evaporation, therefore, must be measured; they must be placed amidst the greatest currents of air that enter our abodes, that they may be diluted. A constant habit of using disinfectants without necessity, has produced diseases of the lungs, terminating, in one instance to our knowledge, in death; the individual having, however, a great predisposition to pthisis from his birth.

It is only in following the order of recapitulation, that we recur to the subject of effluvia from the dead. Generally speaking, every thing should be done to remove the corpse as far as possible from the surface of the earth, or to hasten decomposition. After battle, in sieges, particularly in times of great mortality, lime, or other substances, should be thrown into the pit with the dead; thus avoiding the occurrence, at a future period, of "*asphyxiation*," syncope, sickness, loss of appetite, tremors,—of which grave-diggers offer us examples; emaciation, from constant feverishness; dejection of spirits, accompanied by sallow countenance, which occur amongst those who live near burial-grounds.

Those persons alone, at all events, should have the baneful honours of sepulture in churches, who, with great advantage and glory to their country, have fought in the field, or laboured in the cabinet. With respect to the mortal remains of such illustrious persons, we might adopt with advantage, of the Eryp-

tians and other nations of antiquity, the example of embalming. Bodies were then surrounded with wax or gum, to keep them from the effects of the atmosphere—with absorbing and desiccating substances, to take up moisture, and aromatics to prevent putrefaction.

We cannot better conclude this subject, than by borrowing the words of a French author, who says, “we have now long since entirely abandoned the pernicious habit of burying in the precincts of towns, and we shall never revive it. We hope other nations, who have not yet done so, will lose no time in imitating our example.”

CHAPTER X.

CIVILIZATION.

A VERY useful, and indeed essential, part of a course of study like the present, is, to show in what particulars a refined state of society militates against the health of a community. The substitution of art for nature—the excitation of the passions—the overstraining of the mental powers—the many arduous professions, and still more, the many new trades—are among the causes that, in civilized states, produce in the human being, fatuity or madness; render him feeble or deformed; and, still more frequently, curtail his existence.

In what manner these evils occur, and how they may be best palliated or removed, we hope at some future period to indicate; at present, the attention of the reader is solicited to a very different prospect—and we consider it far from being superfluous or uninteresting, to observe how much, notwithstanding the evils enumerated, civilization has contributed to the aggregate health and years of man. One of its prominent merits, the happy result of the reasoning powers acting upon the accumulated observation of man, is

Hygiène, whose intimate connection with civilized life, and influence over it, must not be overlooked. In the lowest state of society, indeed, men must have some glimmering of its value, and may seek to discover its secret springs of health; but it is in the bosom of civilization alone, that it can be made to pour a beneficent stream, augmented by the general contributions of science and of art.

Though destined for a future eternity of separate existence, still, for the purposes of our present being, mind is, in many respects, completely interwoven with living matter. The mental and physical parts of our nature are susceptible of constant action and reaction on each other, and of supplying, each in its turn, the energy of which the other may be temporarily deficient. Hence, man can never be most favourably situated, where his existence is too exclusively physical; and in that equilibrium of functions called health, mind must have its quota of power in the balance.

Thus, at the first glance, we see that civilization, developing the powers of mind, cannot be inimical to health. But it is more important for our practical purposes, to consider other arguments in its favour—and thus, taking a country, in the state in which it may first be discovered by navigators, what do we find? In the warmest and most fertile regions, immense forests, jungles, or marshes, cover the land; the former impervious, from the entangled growth of underwood, or dangerous from their reptile inhabi-

tants; the jungles, inhabited by tigers; and the marshes fermenting with animal and vegetable remains. Death there triumphs; and if man be found amid such scenes, scarcely superior to the beasts with whom he disputes his food, and possessing but a few rude and insufficient weapons to attack his prey, he almost starves amid the wild luxuriance that surrounds him.

But the scene changes. The navigator has announced his discovery; has described the wealth of the untouched soil, the resources of its climate, the unclaimed riches of its interior; and colonists have ventured to the land of promise. The forests now are felled and burnt; the sun and air admitted; the land is cleared. The reptiles, and its other noxious possessors, disappear; the marshes are drained; and the soil, exposed to the solar heat and purifying winds, becomes, instead of the destroyer, the fruitful supporter, of human life, and the bounteous rewarder of human industry.

But the arts of civilization stop not here. The domestication of animals, and the cultivation of individuals of the vegetable kingdom, alter, as well as improve, to such a degree, their appearance, that, in the course of time, the eye of the learned botanist or zoologist alone can detect their original types. The size and colour of the animal are changed, and its flesh rendered tender and digestible, by domestic management, by crossing of breeds, by peculiar nurture and food, by spaeing the female, and castrating

the male, &c. By means no less familiar to the cultivator, the sloe becomes the luscious plum—the stunted and acrid crab, grows into the glowing apple—and plants of a poisonous class, as the potato, become the main nutriment of nations.

But if the most luxuriant nature be an useless gift to man, without the arts of civilized life, it is equally certain, that a country which, in the palmy state of social superiority, supported a dense population at home, and exchanged its superabundance for foreign luxuries, may become, by degradation from that “high estate,” incapable of furnishing the same population with the bare means of existence. Many are the fertile lands disappearing beneath the incrustation of new substances, allowed constantly to form and accumulate. On beholding vast steppes or deserts, or seas of moving sands, how difficult, at first, is the belief, that in wilds so desolate and barren, nations formerly existed, whose glories still illumine the page of history!

Egypt, whose wondrous structures, whose stupendous pyramids, whose population and commerce, whose arts and sciences—in a word, whose *civilization*, in its fullest sense, have been the admiration and wonder of all succeeding ages,—the land of Egypt is fast disappearing beneath the invasion of sand. Every succeeding year adds a new stratum; and the sand now, in some places, blows fairly into the Nile itself—the source whence all the fertility of the land is derived. Had this destructive tribute been buried

yearly as it came, by the plough or the spade, mixed with manure, and still covered by its periodical irrigation, it might, even in our times, have maintained a nation, enlightening the world in peace, and subduing it in war.

What has been observed of remote countries but recently discovered, and of nations now living but in history, is everywhere equally applicable. In the settlements of North America, disease and mortality are receding before the blows of the axe, and the burning of the trees it fells. Wolves, which in 1740, still existed in Ireland, are now altogether destroyed in the British islands; other noxious animals, which prey upon the resources of man, are disappearing from Europe; and in some of its worst of marshy lands—those of which the thrifty Dutchman has defrauded the sea, and which he only retains by his dykes, and by pumps worked by windmills—the effects of constant cultivation have powerfully counteracted that malaria which, at Walcheren, some years back, nearly destroyed an English army.

The reverse of this picture is presented by some of the finest cities in the world. The neglected Pontine Marshes, where the life of the miserable inhabitants may more properly be styled a lingering death, once supported a people vigorous in mind and body, and imperishable in history. From hence has Fate advanced to destroy the cherished pride of many ages. Rome, once the queen of cities, but foredoomed to the fate of Babylon, is daily diminishing in population.

The malaria advances from street to street, and has already become the sole tenant of some of its finest temples, churches, and palaces. Rome, indeed, might be singled out, as offering in itself a history of most that is interesting in the police of health. When still the capital of the world, in spite of the malaria, she overflowed with population; and her disadvantages were counteracted by the activity and moral excitement of her inhabitants, the drainage of marshes, the width of streets, the abundant supply of pure water from forty aqueducts, &c.

Speaking of large bodies of men, the value they set upon life must be commensurate with the extent of its resources; while these, on the other hand, will be increased by the stimulus which a growing taste for them gives to industry. When, therefore, they begin to fail—when industry loses its stimulus with its reward, we relapse into a proportionate recklessness of life in ourselves or others; which, besides a general demoralization of character, must produce a total indifference to the sanatory means that preserve it.

Nothing is perhaps more calculated to enlist our best feelings in the cause of civilization, than the powerful contrast it presents to savage life, in the view it takes of the first and last stages of human existence. The savage, in general, feels little repugnance in consigning to death helpless infancy or decrepit age, whose support might burthen his feeble resources. In so doing, he conceives himself

inflicting no wrong. Men, whose sufferings and privations have led them to consider the world as ruled by malignant deities alone, whom they think to propitiate by self-inflicted tortures, have little value for life, and extinguish it remorselessly, in others as well as in themselves. In civilized communities, on the contrary, infancy and old age are stimulants to industry, and, by exciting to healthful and rewarded toil, confer infinite benefit on the community at large.

The barbarous practice we have mentioned, added to others, all originating in the paucity of their resources, and in a benighted state of mind, causes the scanty population of savage tribes—while a glance at the respective claims of different nations to superiority in civilization, may serve to prove, that the better founded those claims, the more multiplied we find the sources of health and longevity. The stage of society most favourable to the fixed establishment of morbid evils, is, where it is stationary in civilization, or where empires are on the decline, and retain no longer that impulsive energy, either physical or moral, needful to supply the luxuries which their vitiated habits demand. The Chinese, like the Romans of that period when the habitual amusement of the patrician was to view the fatal strife and dying throes of the gladiator, are in an artificial, not a civilized state of society. Though possessed, for ages prior to us, of some of the greatest secrets that refinement can boast, the

nature of their laws and government has circumscribed the progress of human wisdom; and they are still, when convenience demands it, the murderers of their children. From men thus prodigal of life in those who are nearest to them, it were too much to expect an enlightened attention to the public health.

In short, in whatever country or situation we study man, we receive irrefragable proof, that the mental and physical constituents of his being must advance, if "*haud passibus æquis*," at least in a definite proportion, to attain any permanent result.

We know, that from the cradle, the whole being of man is a tissue of wants. His most involuntary movements acknowledge this source: the play of the muscles, the inspiration of the lungs, the dilatation of the heart—the expansion of the eye to light, of the ear to sound, of the nostrils to scent—are but the expressions of want. Hence man is not calculated to live alone, and must thrive in proportion to his links with other men, engaged in a compact of mutual assistance—making these very wants, the development of which must conduce to his health, also a source of virtues, improvements, and discoveries.

In those genial climates where the soil produces many crops in the same year, the fecundity of nature has contributed to retain man in a state of comparative barbarism. Wants too easily supplied, leave him leisure for the indulgence of violent passions,

alternated by intervals of torpid indolence. Such was but recently the state of many parts of South America, where, from the absence of all energy, physical or moral, to repel disease, the ratio of mortality was very great. When this new field for speculation was opened to the enterprizes of British commerce, by the separation of the colonists from the mother country, our merchants consigned unwittingly immense cargoes of manufactures, to this fancied El Dorado, which the mass of its people never had dreamed of wanting, and had no means of obtaining either by barter or purchase. The cargoes were nearly given away: but the natives having once known the enjoyment of luxuries, were awakened to a salutary sense of want; their energies became directed into a proper channel for their supply; and, in peaceful times, that improvement in all physical advantages will doubtless ensue, by which alone the rate of mortality can be altered.

What has been observed of the result of ignorance in unenlightened states, may be applied to the lowest grades of society in our more refined nations: "Where there is the greatest ignorance," (an able medical writer has observed,) "there are the greatest and the most numerous crimes; where there is most crime, there is most disease; of which the passions are the prolific source." And this truth, amid all the changes, revolutions, and speculative notions, that for the last forty years have agitated

Europe, has been only the more completely elicited and confirmed.

We have before observed, that the spirit of reciprocity was the soul of civilization; beginning in the simple traffic between man and man, it has extended to the vast and complicated commerce which has reunited, in one bond of interest and fellowship, all the scattered members of his family. After inclement seasons, or convulsions of the elements, where formerly famine used to sweep away the inhabitants of the land, (and such famine still continues to recur amidst many rude nations,) commerce now intervenes to prevent this fatal consequence. In the more ordinary course of affairs, commerce is constantly contributing to maintain that equilibrium betwixt our wants and resources, which is the main source of health. The new plants and animals which the trader imports, and which we render indigenous to the soil, have, by degrees, altogether changed the aspect of the country. Our domestic animals, our garden and agricultural produce, are mostly of improved foreign breed.

Two facts, to which we may at once refer, will afford a striking illustration of the powerful influence of commerce on the prosperity of a country—far superior to its richest natural resources, even though its mountains and rivers should teem with precious metals. While their mines are entailing ruin on successive speculators, the cattle, which the Spaniards first imported and naturalised, are the great resource of some of the South American States, for domestic use

and export; and are so numerous, as to rove through the Pampás in uncounted herds: and in our own time nothing contributes more largely to the support of the numerous and robust population of Ireland, than the exotic root we owe to the venturous genius of Columbus.

If commerce, by the communication of arts and sciences, and of their produce, contributes so powerfully to civilization, and to the increase of population in communities,—on the other hand, these communities cannot long maintain their health and vigour, if its operations are restricted. The population having become disproportioned to the extent of its territorial possessions, the staff of life can only be continuously supplied from foreign sources. The corn laws, whose imperfections we shall not canvass, have been considered too exclusively in a political point of view. A discussion of their merits as regards Hygiène, although we shall not pursue the subject, would be far from irrelevant here; for upon the abundance and the nature of his food, depends essentially, the physical power of each individual in a community, and in a lesser degree, his disposition. This truth did not escape the observation of the poet, whose intuitive knowledge of the secrets of nature, has ever been the theme of universal admiration:—

“ And you, good yeomen,
Whose limbs were made in England, show us here
The mettle of your pasture; let us swear
That you are worth your breeding.”

We have had, unfortunately, too many proofs, that in the most highly civilized states the mortality is, in a great measure, in proportion to the quality and quantity of the food of the inhabitants. The thin wines, the spare and vegetable diet, of the Continent, have been an ineffectual defence against the prevailing evil; whilst the more generous diet of the English gives them, from early life, a strength that enables them to resist disease. In an epidemic attack of the cholera, in India, eighty of the natives are reported to have died, to twenty-five English, out of equal numbers of persons exposed to its invasion. In the cholera, still existing here, the mortality is nearly exclusively amongst the worst fed classes; and in the typhus, which so often ravages Ireland, the same fact is observed.

With equal valour on both sides, is it not generally the physical strength displayed in bayonet charges,—the bone and weight of cavalry, men, horses,—which decide the fortune of the day of battle? and is not this superiority derived from better food?

The difference in the productions of the soil, which form the principal food of man in different provinces, is one of the reasons why, in the recruiting of armies, the quota of men supplied by each district, is found to vary so much in proportion from each other. In some territories, fewer births take place in proportion to their extent—in others, more female than male, or vice versa. The physical development or conformation, also probably varies

according to the soil. Charts have been made in some countries, to show in what districts, recruiting parties can be placed with most advantage ; where men are found of a sufficient height for grenadiers and cuirassiers ; where they are adapted for light cavalry and infantry, &c.

These are facts of the same universal character as those formerly mentioned, which go to prove that longevity conduces to civilization, and to the superiority of nations—that monogamy, by maintaining the proportion between the sexes, of twenty-one to twenty-two, contributes no less to effect these desirable objects of governments, &c.

Observations of this nature lead us naturally to seek, and reflect on, those recondite, general, fixed principles, by which the welfare of mankind is governed—principles which, while they hold a sway over human existence, the circumstances in which they obtain, are still susceptible of certain modifications by human will.

As man's superiority is founded more on his intellectual than on his physical nature, moral and political causes will, therefore, always interfere, to render inaccurate all general conclusions derived from reasonings exclusively physical. But if we suppose two nations morally equal, or if we exclude moral agency, we shall immediately decide, upon an inspection of abundant and correct statistical reports, which of those nations will obtain the superiority in war, or in any other given pursuit that demands a display of

physical power. Mr. Moreau de Jonnés has lately published some interesting statistical facts, on the average of ages in France, which aptly illustrate our meaning. He finds that the number of persons in that country, between the ages of fifteen and sixty, constitutes two thirds of its population; while in other states of Europe, it forms but one-half. We must hence conclude, that France can bring into the field more soldiers by one-eighth, than its rivals in power.

The effect of arts and sciences on the development of the mind, and (through its medium) on the animal economy, is a subject of universal interest, but too intricate to be introduced here. We cannot, however, pass over the more direct effects of the arts and sciences, in adding to the years of man.

The arbitrary power by which the priesthood of pagan times ruled despotically the minds of the civilized nations of antiquity, was grounded but on a fraction of the knowledge we now possess, then magnified and enhanced by the veil of illusion and mystery. The power of working miracles, of vaticination, and of delivering oracles, are the undoubted attributes of the high-priests of science, in the present day; as to prophetic power, have we not examples of it in ordinary men of science? Cadet de Metz, in 1783, predicted, from geological appearances, the fall of a hill, which was in course of excavation, to establish a communication between the provinces of Nice and Piedmont. Having examined the emanations arising from the

soil, he publicly announced before its occurrence, an earthquake that took place in the same year in Calabria. He foretold to the inhabitants of Roquemaure (Department du Gard), that if the Rhone, which had been turned from its habitual course, was not restored to its bed, an exterminating fever would possess the land—which occurred. Monsieur de Vidaurre announced, four months beforehand, the earthquake which destroyed Lima in 1828, &c. &c*.

Miracles may well be ascribed to men, who find in a bushel of our commonest combustible coal, virtue to raise seventy millions of pounds' weight a foot high ; and who, by twenty-eight grains of powder, can rend a bar of iron, which could have resisted the strain of forty thousand pounds.† By a recent discovery, and the use of a salt extracted from an exotic tree, that endemic disease which has reigned despotically over a larger extent of country, all over the world, than it has ever been given to the mightiest autocrat to govern, is remarkably controuled. From the refuse of the soap-boiler, a primary substance has been extracted, which palliates or cures the deformities by which the inhabitants of Alpine vallies are assailed. By the use of the lymph of a diseased animal, a malady of the human species is forestalled, which raged, at its first outset, like a pestilence, and, in countries where

* Eusebe Salverte—"Sciences Occultes."

† For these and many more examples of the same description, vide Mr. Herschell's admirable Discourse on Natural Philosophy.

It is not resisted by this means, still inexorably exacts its annual tribute of victims.

We could be contented to ground upon the change in the rate of mortality in the British naval service, on the one hand, the value of civilized resources, and on the other, the importance of Hygiène. A mortality from the scurvy, of from twenty to thirty persons per diem, was not uncommon in ships formerly, whilst the remainder of the crew was so palsied by disease, as to leave the dead unburied in their hammocks. Medical writers describe ships as the worst of abodes—to be not only like a prison, with the chance of being drowned, but worse in every respect—with less room, worse air, worse food. Such was the fatal virulence of the scurvy, that in 1726, Admiral Hosier, having sailed to the West Indies, with seven ships of the line, buried his crews twice, and ultimately died himself of a broken heart. By the administration of citric acid, of the juices of plants, accompanied by many observances of Hygiène, the British navy enjoys, perhaps, at present, a greater freedom from disease than any other class of the community. Captain Cook (to whom we are eternally indebted in this respect) sailed round the world without losing a man; and the yearly report of cases of scurvy, in Haslar naval hospital, in 1780, was one thousand four hundred and fifty-seven; in 1807, one!

Whilst nature is seen to mould every form of matter from a limited number of primary elements, and the decomposition of one body seems but the prepara-

tory process to the formation of another, human ignorance always lavishly wastes our resources. On the contrary, science, a close imitator of nature, having penetrated into the original composition of bodies, has established the most beneficial system of economy. Old and dry bones have been made to furnish nutriment—rags converted into sugar—sawdust into nutritive flour—putrefying meat into pure food—mouldy flour, into good bread: not mere philosophical curiosities these—but resources in scarcity. At the time of the French revolution, the support of the French armies was much assisted by the process applied by Papin to refuse bones; and during the late continental wars, the same nation, shut out from their colonies, drew sugar from the beet-root. We may appeal to the process that has followed the magnificent discovery of gas-light, as an example of the most admirable economy, introduced by science, in the use of necessities of life. This process is so improved, that whilst the illuminating gas is more abundantly obtained than formerly, coke is left for common firing; and tar, combustible oil, &c. are obtained for other purposes of life.

Setting aside all the discoveries of science we have mentioned, and the many others by which the life of man is immediately preserved,—such as the conductors of lightning; the lamp by which the coal-miner, the magnetic mask by which the needle-makers, are saved from rapid destruction; the anti-septic processes, by which whole communities are protected from dis-

case,—we may appeal to one process alone, emanating from scientific engineering, as having conferred immense sources of longevity.

Assisted by the light of geology, the mighty excavations, extending even beneath the waters of the sea, have furnished the materials of an abundant supply of artificial heat. The importance of this material, not only to the purposes of trade, but to health and the prolongation of life, we have discussed in a foregoing chapter. As an instance of its beneficial influence upon the atmosphere, we must remember, that it was by fire (a visitation so disastrous at the time!) that London was eventually purified from the plague, which, in the fourteenth century, swept one hundred thousand of its then comparatively slender population to the grave.

We also must consider artificial heat as prolonging existence, by affording sustenance to animal heat; and it effects the former object in numberless other ways, directly or indirectly, by softening and rendering food digestible, &c. &c. In one town of England alone, a yearly consumption of one million and a half of chaldrons, takes place. The Englishman enjoys the cheering, purifying and other salutary effects, of a constant fire; whilst other nations have but a scanty or precarious supply of expensive wood. Some are confined to the use of peat or furze, or the dung of animals. The Persian crouches over a pan of asphyxiating charcoal; and the Egyptian near the pyramids, is obliged to burn the coffins, together with the mummy bodies, of his ancestors.



It does not consist in to "bank" it the superiority which the abundant supply of coal will give the English, whenever brought to the disastrous alternative of a foreign war, or the generation of steam, which cannot be employed on a large scale without coal. It is, perhaps, indeed, recently more to the advantages and life of man in peace, than all the discoveries that preceded it.

There are obstacles to the welfare of man, which, like immense weights, or huge barriers, one man or a few cannot move out of their path, without an eternity of continued industry and exertion, but which the simultaneous exertion of a larger community removes with rapidity and comparative facility : and this is another amongst the many advantages of civilization. But civilization itself was, in many respects, little progressive, until the discovery of the steam-engine ; which, by some mighty strokes of its piston, levelled the road to otherwise unobtainable benefits. The steam-engine is so near an approach to a human being created by man, that it seems to fulfil the dream of the Promethean, only that we have raised a beneficent power, instead of a demon. It regulates its own supplies, and presides over its own safety, and can act with a thousand-fold power in performing the work of man. By the certainty of the supply of resources, which the rapidity of its propulsion of ships and carriages affords us, it tends to equalize the fate of nations, to remove that fear of the morrow which ever preys upon man, and to impart that comfort and

peace of mind which are the main sources of health.

But the laudable parsimony of the resources of life which, as we have elsewhere observed, distinguishes civilization, we shall also find to extend to human life itself—we mean, in the scope which it affords to the mental energies of the physically impotent.

The more rapidly a nation advances in civilization, the more those amongst its inhabitants who are deformed, or of weak and valetudinary habit, will find of avenues to wealth, and distinction in science, arts, commerce, mechanics, professions, &c. &c. In a rude state of society, they would have been useless burthens on the community, or have perished prematurely if dependant for support upon agriculture, the chase, or warlike pursuits: nor would their prospects have been better in feudal times, unless superstition had afforded them a refuge in the cloister, or they had been tolerated by the powerful of those days, as privileged jesters, or as foils, from their deformity, to the gigantic proportions of their warrior patrons.

The vigilance of a government, enlightened by the scientific bodies of the state, and seconded by the influence and exemplary habits of the better classes, and the industry of the rest, can do more for the healthiness of a country, than all its natural advantages, (as we shall presently show from statistical facts,) and all the science of the most gifted medical men, dispersed in ever so great numbers throughout the community. Most of the

elements with which a government can act were, till lately, wanting. England changed from a despotical to a free state, at a period when science was too little advanced for the nation to have felt the advantage of keeping in the hands of government the direction of all that relates to the health of the people. It is but lately that a correct census has been published, with tables of mortality and statistical reports on the health of the nation, that could afford a basis of reasoning. The mere possession of such materials, suggests conclusions of the most important bearing on the welfare of all, and has opened the eyes of influential men to the conviction, how well-grounded was the esteem in which Hygiène was held by continental nations.

It is not long since the privileged medical bodies have begun to hold sittings for public discussion, and scientific societies, which may throw light on the subject, have turned a portion of their attention to public health. The objects the most important to attain, are, a sufficient controul of government over hospitals, &c.; to bring such institutions for health to an unity of effort and a similiarity of aim, and obtain from their reports, and those of every parish in the kingdon, a comprehensive body of knowledge to enlighten and controul persons of the least authority in the state:

The statistical reports which refer to the special topography, and to the peculiarities of habits existing in England, once obtained, nothing would be more

easy than to establish a perfect system of Hygiène in this country. The numerous councils of health abroad not only afford us models for similar institutions, and for the mode of their proceedings, but they have also collected a great mass of facts and results for the enlightenment of their imitators. No modern nation, however, can lay claim to the first establishment of so salutary a system; neither are our sources of experience restricted to contemporaneous annals. Hygiène, like many splendid creations of human intellect, belonged to the bright eras of ancient civilization, and has been merely awakened from its long slumber of the dark ages.

Without detailing the systems of the Jewish, Persian, and Grecian nations, each of which possessed enlightened systems of laws for the preservation of public health, the Romans alone offer a complete model for their formation, and one that proves also that such a system is as applicable to an immense and very populous community, as it is to a confined one. The classic reader need not be reminded of the titles and functions of those persons who, in Rome, presided over public salubrity; nor of the numerous enactments of that nation—from the laws that watched over the increase of population, to the minuter attention bestowed on the maintenance of baths, aqueducts, sewers, &c. However, those who are bound by their offices to the government and guidance of their fellow-men, might do well to remark the contrast we mentioned before, as

furnished by ancient Rome, while wisely insisting on the observance of laws replete with beneficent results, and its present state, when the decay of health and decrease of population accompany the neglect into which those laws have been permitted to fall. It is, indeed, the fate of that city to furnish many varied examples of all that is most striking and interesting in the history of man.

Whilst England is hardly awakened to the importance of such measures, she offers unwittingly the most striking example of the benefits of public Hygiène—benefits that have not arisen from pre-mediated measures, but from the improvements inseparable from the conveniences and luxuries of life, enjoyed by so large a portion of its population. The widening or removing of old streets, the establishment of drains and sewers, and the cultivation and draining of land, have caused much beneficial change in the health of the country at large. For instance, in London, the aguish Swallow-street has been replaced by the airy width of Regent-street. Portsmouth, from a town infected by malaria, has become a healthy residence, in spite of the great increase of its inhabitants; and in the Isle of Ely,* where the proportion of deaths to births was as seventy to sixty-one, the former number was reduced, in a few years, to fifty-one, and now, probably, the improvement is still more considerable.

* Sir John Sinclair.

We feel more desirous to embody, and extensively to apply, the causes which have been silently acting with civilization, when we survey the regularity of increasing improvement, and the diminution of the destructive sway of contagion and epidemy, that has been going on progressively for several ages. Leprosy, which made ravages in Europe during whole centuries, now, in the very few spots where it exists in this quarter of the globe, does not appear to be even communicable by ordinary contact; and the sweating sickness, which five times in seventy years swept over England, and was so violent as in some cases to kill those it attacked in an hour, has finally disappeared altogether.* The extent of the improvement is seen at a glance, in the population reports lately published by order of parliament.

A great pestilence originating in the east in 1345, reached England in 1348, and 100,000 persons were buried in the city of London. In 1563, more than 20,000 died of the plague. In 1592, 15,000. In 1603, 36,000. The number of these destructive

* A species of sweating sickness is, at this moment, concomitant with the cholera in some districts in France; which may lead us to believe that this disease only requires a favourable soil, to flourish once more in all its banefulness in our temperate regions. As the organization of the human body must always remain the same in all essential points, and in all ages of the world, it would not be reasonable to doubt that the same circumstances would reproduce the diseases that at present exist but in the nosology of the antiquary, or in the more distant parts of the globe.

visitations, were the origin of the bills of mortality, which were intended to warn the court and the opulent inhabitants when the fatality of the plague rendered their emigration advisable. In the year 1625, 35,000. In 1636, 10,000; and in 1665, 68,500. The fire, to which we have already alluded as destroying London in 1666, and after which the plague languished, disappearing altogether in 1679, has triumphantly proved how effectual, though in a lesser degree, the means of purification recommended by Hygiène are, either in arresting the progress of great scourges, or in shutting them out forever; nor have means of outward defence, brought forward by scientific men, been less certainly effectual, the plague having appeared and been extinguished in lazarettos, since it has ceased to be the general scourge of nations.

A survey of a larger portion of the earth's surface will no less illustrate and verify the assertion, that the progress of civilization tends to diminish disease. The plague of Athens need scarcely be cited, when the streets were strewn with dead bodies;—nor that of Paris, in 540, when the town was so depopulated that wolves invaded it; or in 1332, when eighty thousand persons, including princes of the blood royal, fell victims to it;—or the plague of Constantinople in 542, when five thousand persons died per diem, a pestilence which lasted fifty years. Thirty-three visitations of plague assailed Italy during the first seven hundred and thirty-two years of the Roman

Empire. From the beginning of the Christian era till 1680, Europe experienced ninety-seven great epidemics. In the great plague of 1230, nine hundred thousand are said to have been buried in one city of China alone. Taking a country more recently civilized, what comparison can the slight ravages of the recent cholera in Moscow, for instance, bear to those pestilences which assailed it so late as 1713, and even 1730, on each of which occasions, one hundred thousand persons died! And, with regard to one nation, one of the oldest in civilization in modern times, what comparison can exist between the recent mortality in Paris, (whose large amount we were perhaps justified in attributing in a great measure to the moral agitation which has affected that nation for the last forty years,) and the plague which occurred in Marseilles, so late as the Regency of the profligate Duke of Orleans!—These facts appear to speak volumes to all nations of the earth, and to their governments.

As nations become less affluent, and recede from that state of society most favourable to the sciences and arts, morbid evils resume their sway; and it has been justly observed, that Egypt, which has already furnished us with another illustration, could not have had that flourishing and dense population, its unparalleled antiquities prove to have existed, if the plague

* For a more enlarged history of epidemic, vide the highly interesting article, of the highest merit, entitled "Consolations," in the "Feuilleton" of the *Journal des Debats* of the 27th May.

formerly raged in that country, as it does at the present day. It has been clearly proved that the varied operations of a numerous population on the soil, &c. can alone banish disease from insalubrious countries.

When we seek to add conviction to reasoning and probability, on the subject of the benefits of civilization, in our acceptation of the term, we find it proved, by the comparative duration of life in the present and in ancient times.

The average duration of life amongst the respectable classes in cities, is in France, forty-two, in England, forty-five years. Among the patrician order in ancient Rome, the average was thirty years—giving to moderns the advantage of twelve years more of life in the one, and fifteen years in the other instance, over this great nation of antiquity. That no doubt may remain of this superiority being attributable to improved civilization, we have but to refer to the data of Dr. Vilermé, and compare the rates of mortality in France, at different periods of time: we shall ever find longevity increasing in proportion to civilization. The mortality in Paris, in the seventeenth century, was one in twenty-five or twenty-six, whilst in the fourteenth century, it was one in sixteen or seventeen. It is now one in thirty-two!

If we cast a glance over the statistical tables of mortality in Europe, where the differences are less considerable than betwixt Europe and the other parts of the world, we see that in Italy, one person dies in twenty-eight; in France, (where wars and revolutions

have perhaps killed more human beings by the disease they entail, than by sword and guillotine,) one in forty; in the late kingdom of Holland, one in forty-eight; in England, one in fifty. Amongst these, we may select the superior longevity of England, to prove the benefits of a better moral and physical condition, far outbalancing the effects of a good climate. In England, the weather is damp, foggy, and variable. In Italy, the air is generally pure, and the serene and cloudless sky are the theme and inspiration of poet and painter; yet is England superior to Italy in the proportion of fifty to twenty-eight.

When we asserted that population constituted the power and riches of states, we were fully aware that it might be objected, that England, China, and other countries, were over-populated. Having observed, in our defence, that still these countries are exceedingly rich and powerful, we refer to statistical medicine, which clearly points out a remedy to statesmen. In Paris, for example, the proportionate increase between the lower class and the superior, is as one child in thirty to one in fifty. Our readers are in possession of one of the causes of this greater fecundity in the former class; but it arises also in a great measure, from the uneducated never thinking how they are to support the offspring of their marriages. It is the spread of knowledge, which, by leading men to reflect, and by teaching them the circumspection of the rich, that can alone form an adequate check to this evil.

We are borne out in this opinion by several great political economists. Malthus remarks, that marriages, births, and deaths, diminish in proportion to the increasing healthiness of a country.* In 1801, the proportion of marriages (which had previously been so much as one in 115 persons per annum), was one in 123—the births, one in 34-8. Already, in 1821, the marriages had diminished to one in 131; the births, to one in 36-58.

The study of statistical tables shows us even a more potent influence upon population than we could hope to find—that produced by the religious and moral feeling of communities. They are, perhaps, the only means of combating such drunkenness and licentiousness, as, fostered by civilized life, shorten the lives of men, render the women comparatively sterile, and indirectly destroy the infant part of the community. In dissolute countries—although the fecundity of the poorer class is so much greater—in large towns, at five years of age, their children scarcely outnumber those of the rich. If we refer to the fearful details given by the Statistical Society with regard to Ireland, where a dense population is contending against the most adverse circumstances,

* We are aware that these facts are expressly contradicted by Mr. Sadler. We have, however, the opinions of persons of eminence in other countries, to balance the weight of his opinion. Without referring the reader to foreign sources, not so readily accessible, we think he will find in Dr. Hawkins's excellent Statistics the necessary elucidation.

we shall find the same destruction of infant life, and an illustration of the palpable axiom, that population is swayed by the means of subsistence.* In Paris, out of one thousand foundlings annually received into the hospital, half die before the end of the first year.

The diffusion of happiness and tranquillity, the excitement of hope or emulation, the stirring objects of ambition, the pursuit of an interesting employment alone, will preserve men from the invasion of disease. Plato remained scathless amid the ravages of the plague; and the physician moves unhurt amid the diseases he is daily called upon to alleviate. The zeal of the pursuit of science enabled Captain Franklin and his companions to endure living on tripe de roche, and all their other excessive trials. The soldier, relying on his country's gratitude, bears a hurried amputation on the field of battle, and the jostling afterwards for miles in a cart, perhaps without food or water, and recovers; whilst, in the comfortable civil hospital, the same injury proves fatal to the mechanic, who, with his limb, loses his prospects in life. The ardour of an attack cures all lesser ailments, whilst a retreating army has countless sick. Seldom, perhaps never, has misfortune oppressed the moral feelings of a nation without producing disease. He who reads, first, Boccacio's awful account of the plague in Italy, which destroyed, at one fell swoop, all the bonds of social life, and with them the defences

* J. B. Say—"Economie Politique."

against disease—and then turns to recent details of shipwrecks of English mariners beating about on a raft, on unfathomed seas, and afterwards stranded on desert shores, to contend with every ill, with no resources left them but strong hearts and minds—will see the moral power of the human mind in overcoming bodily evils. It has been no less clearly shown, that civil wars, tyranny, and oppression, and the moral and physical degeneracy of mankind, are the natural allies of morbid evils. Wherever we survey the affairs of this world, we find pestilence, famine, war, and revolution, to be but the different venomous heads of the same hydra.





